National Round Table on the Environment and the Economy | Table ronde nationale sur l'environnement et l'économie

Response of the National Round Table on the Environment and the Economy to its Obligations under the *Kyoto Protocol Implementation Act*

July 2010

National Round Table on the Environment and the Economy | Table ronde nationale sur l'environnement et l'économie

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TRANSMITTAL LETTER FROM THE CHAIR AND PRESIDENT AND CEO

July 2010

Dear Minister:

The National Round Table on the Environment and the Economy (NRTEE) is pleased to submit to you its fourth response to its obligations under the *Kyoto Protocol Implementation Act (KPIA)* with respect to the government's 2010 Climate Change Plan and Statement.

In carrying out its statutory obligations, the NRTEE has undertaken research, gathered information, and produced a written response as required. This activity focused on addressing Subsections 10(1)(b)(i) and 10(1)(b)(ii) of the *Act*. As allowed for under Subsection 10(1)(b)(iii), the Round Table has also reviewed and commented upon broader aspects of the issue as it relates to the government's Plan and Statement.

With this document, the NRTEE has fulfilled the filing requirements of Section 10 of the *Kyoto Protocol Implementation Act*.

We wish to thank officials of Environment Canada, Natural Resources Canada, Transport Canada and the Commissioner of Environment and Sustainable Development, for their cooperation in providing information that we used in the preparation of this response.

We hope this document will be useful to you, the government, and Parliament in considering climate change policies and greenhouse gas emission reductions.

Yours sincerely,

Robert Page, Ph.D.
Chair

David McLaughlin
President and CEO

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THE NATIONAL ROUND TABLE ON THE ENVIRONMENT AND THE ECONOMY: ABOUT US

Emerging from the famous Brundtland Report, *Our Common Future*, the National Round Table on the Environment and the Economy (NRTEE) has become a model for convening diverse and competing interests around one table to create consensus ideas and viable suggestions for sustainable development.

The NRTEE focuses on sustaining Canada's prosperity without borrowing resources from future generations or compromising their ability to live securely.

The NRTEE is in the unique position of being an independent policy advisory agency that advises the federal government on sustainable development solutions. We raise awareness among Canadians and their governments about the challenges of sustainable development. We advocate for positive change. We strive to promote credible and impartial policy solutions that are in the best interest of all Canadians based on research, stakeholder engagement, and consideration by Round Table members.

We accomplish that mission by fostering sound, well-researched reports on priority issues and by offering advice to governments on how best to reconcile and integrate the often divergent challenges of economic prosperity and environmental conservation.

The NRTEE brings together a group of distinguished sustainability leaders active in businesses, universities, environmentalism, labour, public policy, and community life from across Canada. Our members are appointed by the federal government for a mandate of up to three years. They meet in a round table format that offers a safe haven for discussion and encourages the unfettered exchange of ideas leading to consensus. This is how we reconcile positions that have traditionally been at odds.

We also reach out to expert organizations, industries, and individuals to assist us in conducting our work on behalf of Canadians. These partners help spark our creativity, challenge our thinking, and generate the momentum needed for success.

The *National Round Table on the Environment and the Economy Act* underlines the independent nature of the Round Table and its work. The NRTEE reports, at this time, to the Government of Canada and Parliament through the Minister of the Environment.

The NRTEE maintains a secretariat, which commissions and analyzes the research required by its members in their work. The secretariat furnishes research, administrative, promotional, and communications support for NRTEE activities and operations.

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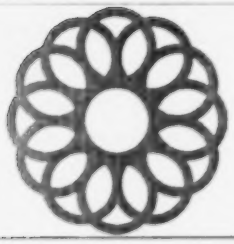
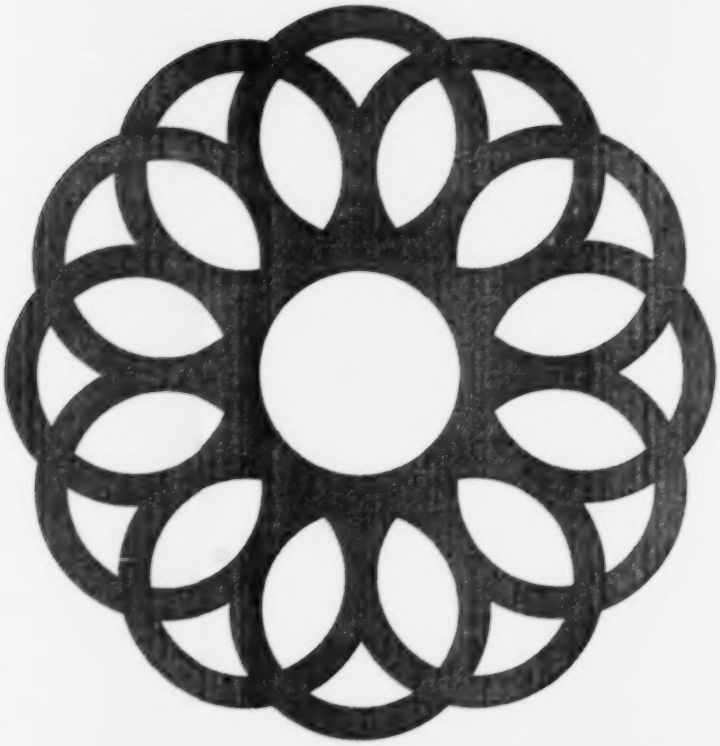


1.0

/ INTRODUCTION



1.0 INTRODUCTION

On June 22, 2007, the *Kyoto Protocol Implementation Act* (Bill C-288, henceforth called KPIA) received Royal Assent.

The KPIA stipulates that the Government of Canada is obliged to prepare — on an annual basis — a Climate Change Plan describing measures and policies enacted by the government to "ensure that Canada meets its obligations under Article 3, paragraph 1, of the Kyoto Protocol" [Subsection 5(1)]. The government's fourth Climate Change Plan was released on June 2, 2010.

Subsection 10(1) of the *Act* requires the National Round Table on the Environment and the Economy (NRTEE or Round Table) to, within 60 days of the publication of the Climate Change Plan stipulated in Subsection 5(1), perform the following with respect to the Plan:

> *a) undertake research and gather information and analyses on the Plan or statement in the context of sustainable development; and*
>
> *b) advise the Minister on issues that are within its purpose, as set out in section 4 of the National Round Table on the Environment and the Economy Act, including the following, to the extent that they are within that purpose:*
>
> > *i) the likelihood that each of the proposed measures or regulations will achieve the emission reductions projected in the Plan or statement;*
> >
> > *ii) the likelihood that the proposed measures or regulations will enable Canada to meet its obligations under Article 3, paragraph 1, of the Kyoto Protocol, and*
> >
> > *iii) any other matters that the Round Table considers relevant.*

This report represents the fourth response of the National Round Table on the Environment and the Economy to the requirements created by the *Kyoto Protocol Implementation Act* with respect to the government's fourth Climate Change Plan. In carrying out its statutory obligations, the NRTEE has undertaken and gathered information. This activity has focused on addressing Subsections 10(1)(b)(i) and 10(1)(b)(ii). As allowed for under Subsection 10(1)(b)(iii), the NRTEE has also reviewed and commented upon broader aspects of the KPIA as it relates to the government's Plan.

In accordance with the stipulations of the *Act*, our Response has been provided to the Minister of the Environment. This fulfills the NRTEE's current obligations under the KPIA.

The government's 2010 KPIA Plan, *A Climate Change Plan for the Purposes of the Kyoto Protocol Implementation Act – May 2010* (henceforth referred to as the 2010 Plan),[1] details expected emissions reductions resulting from specific measures to address climate change, as well as an integrated modelling analysis[2] that presents the reductions expected to accrue from the full suite of policies relative to a reference case, or *business-as-usual emissions pathway*.[3] The stated emissions reductions for individual policies outlined in the 2010 Plan are derived from initiative-level evaluations performed by Environment Canada, Natural Resources Canada (NRCan), and Transport Canada, while the integrated modelling figures are compiled by Environment Canada.

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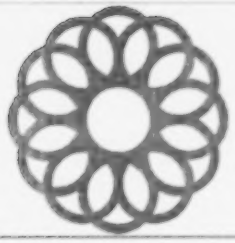
[1] Canada, 2010a. See: http://www.climatechange.gc.ca/Content/4/0/4/4044AEA7-3ED0-4897-A73E-D11C62D954FD/KPIA_2010.pdf
[2] Following a recommendation from the NRTEE.
[3] Denoted in the 2010 Plan as "projected emissions excluding federal government measures".

The analysis in this Response examines whether the stated emissions reductions attributed to the suite of policies as a whole, as well as to individual policies, accurately reflect the incremental emissions reductions we should expect to see as a result of their implementation.[4] By extension, it also assesses the likelihood that emissions projections reflect the best expectations of actual GHG emissions for the years 2008–2012. Finally, it assesses whether Canada will achieve its Kyoto Protocol GHG emissions target over the defined Kyoto Protocol period.

The 2010 Plan notes the NRTEE's contribution from previous Responses toward a "continuous cycle of improvement"[5] and the government's commitment to this cycle. The NRTEE wishes to acknowledge at the outset that the government continues to make improvements to its forecasting, particularly in terms of refining its integrated modelling approach and providing transparent accounting for the effects of provincial policies. We hope that the 2010 Response from the NRTEE can further assist the government in its ongoing efforts to improve GHG forecasting and policy evaluation.

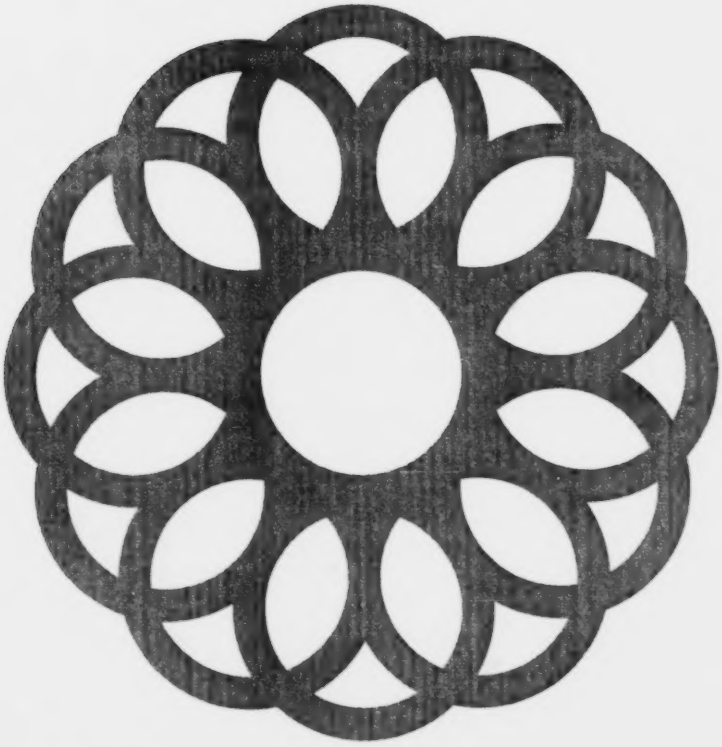
This Response is organized as follows: Section 2 describes the methodological approach taken by the NRTEE in its analysis. Section 3 provides an overview of the 2010 Plan itself. Section 4 highlights the key issues that emerged from our analysis and assessment. Section 5 evaluates the Plan in the context of Canada's Kyoto Protocol obligations. Finally, Section 6 draws conclusions and provides recommendations. Detailed analysis of individual policies and programs is provided in Appendix A.

[4] Incremental emissions reductions are those that occur over and above what could reasonably have been expected to occur absent the policies or actions.
[5] Canada, 2010a, p. 2



2.0

/ METHODOLOGY



2.0 METHODOLOGY

In its 2007 Response to its obligations under the KPIA, the NRTEE developed an analytical framework by which to evaluate the likelihood that the proposed measures or regulations would achieve the projected emission reductions in the Plan, and the likelihood that the proposed measures would allow Canada to meet its requirements under the Kyoto Protocol. The NRTEE used the same methodological approach in its 2008 and 2009 Responses, and continues to use the methodology for the 2010 Response.

To produce the KPIA Response, the NRTEE assesses the assumptions and methodologies underlying emissions reductions estimates set out in the Plan. It compares the 2010 Plan to previous Plans to assess improvements and the extent to which previous NRTEE recommendations have been met. The NRTEE's analysis is therefore qualitative, not quantitative. An alternative set of numbers for comparison are not produced given the limited time and resources available within the confines of the *Act*. While the NRTEE can conclude with confidence that stated emission reductions will likely or not likely be achieved, we cannot say definitively by how much or what the exact number might be, as this would require extensive alternative modelling and analysis. It is important to recognize that emission forecasting is not an exact science. Its utility lies particularly in the directions it conveys and policy choices it helps illuminate for decision makers.

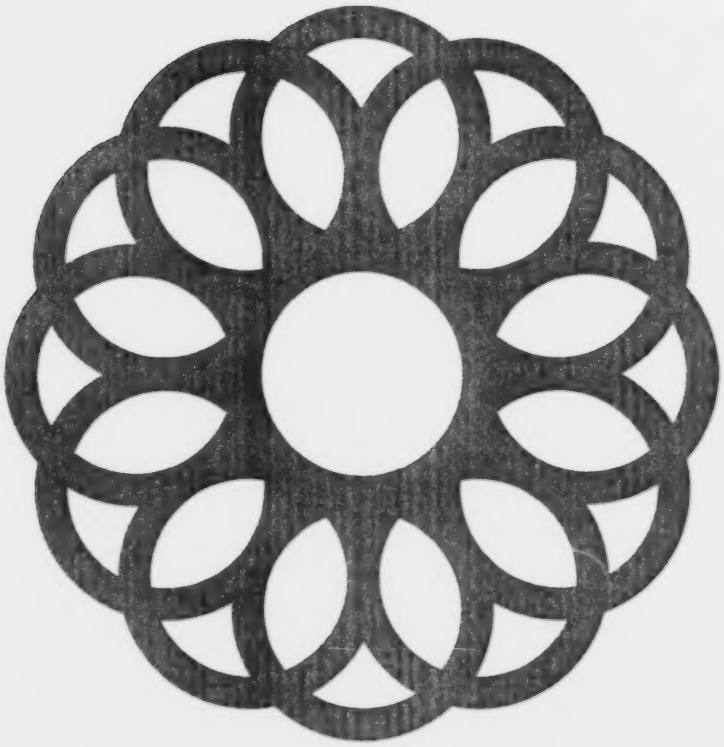
An initial assessment of the necessary (and available) analytical tools and methodologies led the NRTEE to conclude that the best approach to assessing *likelihood* was to determine whether the estimates themselves were accurate descriptions of the outcomes that could reasonably be expected from the policies and program initiatives described in the government's Plan. Given the nature of the mandate and the timelines involved, the presentation of a qualitative sense of predictive accuracy as opposed to a complete modelling of policy outcomes has been chosen as most appropriate. As a result, the NRTEE has derived, where possible, a qualitative conclusion for each policy or measure. The evidence and underlying assumptions will suggest one of the following:

- An overestimate of eventual emissions reductions
- A reliable estimate of eventual emissions reductions
- An underestimate of eventual emissions reductions.

To be clear, the NRTEE is not in a position to provide a definitive statement on the actual emissions reduction level attributable to each policy and measure individually, or in total. Rather, we provide an assessment — on the basis of what is known about the underlying assumptions — of whether the measures and policies described in the Plan are likely to result in the suggested emissions reduction levels. All forecasting is uncertain and cannot be expected to be 100-per-cent accurate. Defining the likelihood of achieving a stated emission reduction must in turn be qualified by this assumption. A qualitative assessment for each program or policy using this framework is provided in Appendix A.

3.0

/ THE 2010 PLAN



3.0 THE 2010 PLAN

Overall, while the contents of the 2010 KPIA Plan contain some notable differences from the 2009 Plan, the approach to estimating emissions reductions remains similar to previous Plans. The 2010 Plan presents projected emissions reductions from individual policies or programs, as developed by the department responsible for the measure. It also presents an overall projection from the full suite of measures; this projection is developed by Environment Canada using an integrated modelling framework.[6]

Key changes from the 2009 Plan include the following:

- The Regulatory Framework for Industrial GHG Emissions from the *Turning the Corner* plan is no longer included in the 2010 Plan. This is significant because in previous years' Plans the Regulatory Framework was estimated to be the largest source of emissions reductions. For example, in the 2009 Plan, the Regulatory Framework represented 55% of forecast reductions.
- Newly announced vehicle fuel emissions standards are included in the 2010 Plan. On April 1, 2010, Environment Minister Jim Prentice announced that Canada would harmonize auto-emissions standards with those in the U.S. for vehicles in the 2011–2016 model years. As the KPIA period ends in 2012, the government has included expected reductions as a result of the new standards for 2010–2012.
- Macro-economic assumptions have been updated to reflect new information and trends in terms of oil and gas prices and economic growth in the integrated modelling forecasts. As the Plan states, "the short-term economic outlook underlying the emissions reference case is grounded in the GDP growth forecast in Budget 2010."[7] This change suggests that economic growth is likely to be slower than assumed in the 2009 Plan, resulting in lower overall emissions.
- Actual Environment Canada Inventory emissions are reported for 2008 alongside the projected emissions for 2009–2012 in the integrated modelling that forecasts the effects of the full suite of federal policies and programs. Previous KPIA Plans did not have Emissions Inventory data to compare forecasted emissions reductions with actual emissions levels during the KPIA period. Forecasts for 2009–2012 are therefore explored in the context of actual emissions levels in 2008.
- Estimates of actual 2008 emissions *reductions* achieved as a result of the measures are now reported in the forecast of emissions reductions from individual policies and programs.[8]
- Emissions reductions from provincial policies are now included in the *business-as-usual*, or *reference case*. This reference case includes all provincial policies implemented before 2009, and federal policies before 2007. Because the reference case in the integrated modelling explicitly includes provincial policies, the scenario that includes all federal policies implemented since 2006 can isolate the impacts of these federal policies, leading to more reliable estimates.
- There are some small changes to emissions reductions forecasts for specific policies and programs. Some specific programs have slightly higher or lower reductions compared with the 2009 Plan. The most significant changes relate to the ecoENERGY for Industrial Emissions Program (greater forecasted reductions) and the ecoENERGY for Renewable Power program (less forecasted reductions). These differences can be attributed to changes in the timing of the policies.

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[6] In the 2008 Plan, the government introduced its integrated modelling framework for the purposes of the KPIA. The modelling is undertaken using Environment Canada's Energy-Economy-Environment Model for Canada, or E3MC. Under this approach, all policies are modelled together in the E3MC model, which simulates the supply, price, and demand for all fuels and also includes macroeconomic effects. Free-ridership, additionality, and interaction effects are addressed through integrated modelling.

[7] Canada, 2010a, p. 33.

[8] Note that as stated in the Plan, unlike expected overall emissions levels (i.e., expected future GHG Inventories), actual emissions *reductions* can only be estimated, not measured, because they are relative to a hypothetical *reference case* or *business-as-usual* scenario.

Definitions for Forecast Scenario Labels

Two types of scenarios are relevant for estimating emissions reductions induced by policies:

The *business-as-usual* — or *reference case* — scenario is the forecast of emissions in the absence of additional policies. The integrated modelling in the 2010 KPIA Plan refers to this forecast as *projected emissions excluding federal measures.*

The *policy scenario* is the forecast of emissions when a given policy or suite of policies is implemented. The integrated modelling in the 2010 KPIA Plan refers to this forecast as *projected emissions including federal measures.*

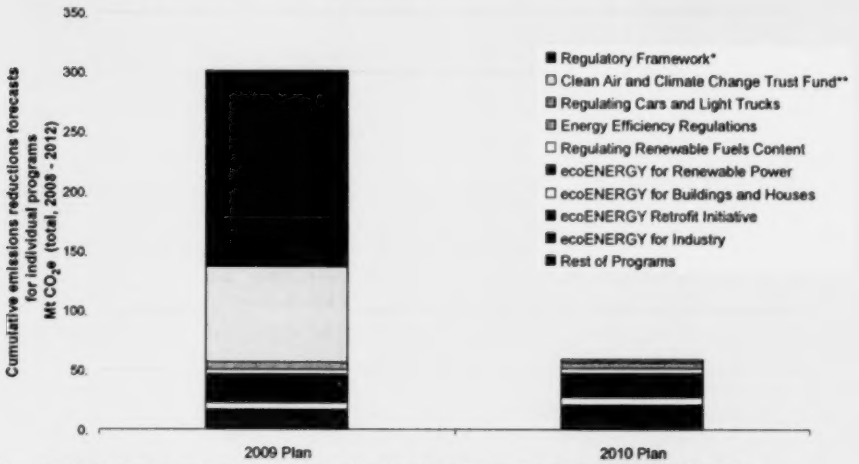
The difference between the emissions forecasts for the two scenarios equals the emissions reductions expected to be induced by the policies included in the *policy scenario.*

Figure 1 shows emissions reductions attributed to individual measures over the Kyoto time frame from the 2010 Plan as compared with the 2009 Plan. In past KPIA Plans, the majority of the program-level emissions reductions were attributed to the Regulatory Framework for Industrial GHG Emissions and the Clean Air and Climate Change Trust Fund. With emissions reductions no longer attributed to the Regulatory Framework and emissions reductions from provincial policies included in the reference case in this year's Plan, programs and policies that had less significance in terms of emissions reductions in previous Plans now play a greater role in contributing to reductions forecast in the 2010 Plan. Figure 1 below illustrates these changes, as presented in the 2009 and 2010 Plans. In the 2010 Plan, the largest reductions are now attributed to the ecoENERGY programs for Renewable Power and Retrofits (20.7 Mt and 6.7 Mt, respectively over the Kyoto period).

The measure-by-measure breakdown of remaining programs in the 2010 Plan has changed little from the 2008 and 2009 Plans in terms of numbers, assumptions, and methodologies.[9]

[9] It is important to understand the difference between forecasted emissions reductions from individual policies and programs in the 2009 and 2010 Plans. The NRTEE's 2009 Response suggested that the emission reductions for the Regulatory Framework and the Clean Air and Climate Change Trust Fund in the 2009 Plan were likely overestimates of expected emissions reductions. As a result, Figure 1 likely overstates the scale of the difference between emissions reductions in the 2009 and 2010 Plans.

Figure 1: Comparison of All Forecasted Emissions Reductions for Individual Programs and Policies as Stated in the 2009 and 2010 KPIA Plans (Cumulative 2008 – 2012)

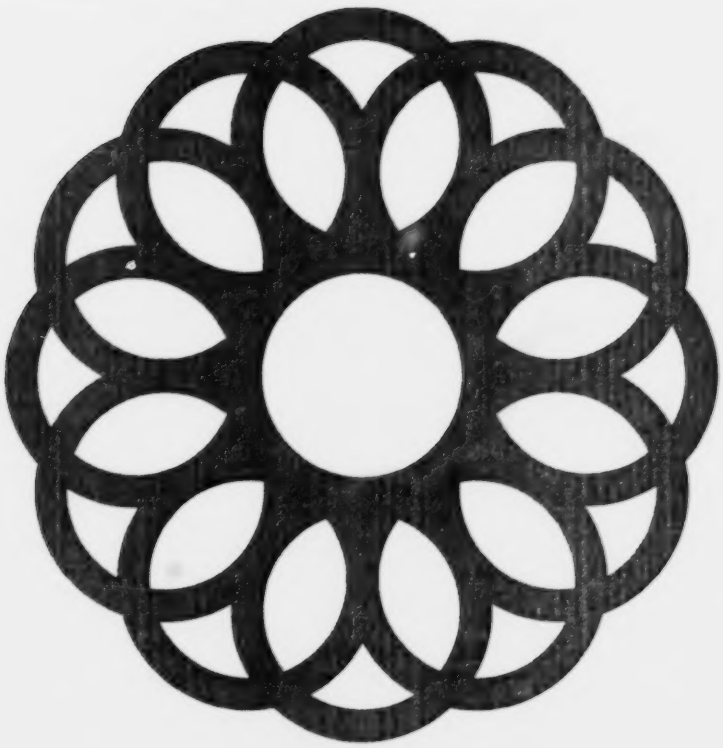


* The Regulatory Framework is not included in the 2010 Plan as this policy was not implemented.

** Emissions reductions from provincial policies, including those funded through the Clean Air and Climate Change Trust Fund were included in the Reference Case in the 2010 Plan, a more transparent and reliable method of doing so.

4.0

/ ANALYSIS AND ASSESSMENT



4.0 ANALYSIS AND ASSESSMENT

A Continuous Cycle of Improvement

As the 2010 government Plan notes, the KPIA process has led to continuous improvements in the government's emissions forecasts since the first Plan in 2007. The NRTEE supports this cycle of improvement. Since 2007, several NRTEE recommendations have been incorporated into subsequent KPIA Plans:

- In its first Response, the NRTEE recommended that the government report on measures in an integrated approach to account for interaction effects between programs that could result in an overstatement of emissions reductions. Also in its 2007 Response, the NRTEE recommended that future KPIA Plans include greater transparency and clarity related to key assumptions and methods. Since the 2008 Plan, the government has responded to these recommendations by using an integrated modelling framework and including greater detail on its modelling assumptions.

This cycle of improvement has continued in the 2010 Plan. In its 2008 Response, the NRTEE recommended that only impacts of announced and reasonably expected provincial actions be included in KPIA modelling. In its 2009 Response, the NRTEE recommended that the government forecast estimates of future emissions reductions in terms of projected changes in Environment Canada's GHG Inventory. The NRTEE also recommended that future KPIA Plans reflect both emissions forecasts *and* actual emissions data documented in the Environment Canada GHG Inventory. The government has responded to these recommendations in its 2010 Plan and has also included the following key improvements:

- The integrated modelling in the 2010 Plan now uses a consistent definition for an emission reduction, namely the difference between a forecast *including* federal policies and programs, and a forecast *excluding* these measures.

- Actual emissions are shown for 2008 and compared to the integrated modelling forecasts, providing context for actual emissions in the Kyoto period.

The NRTEE's 2010 analysis and assessment focuses on two main themes: First, improvements in the 2010 KPIA Plan that respond to the NRTEE's 2009 KPIA Response recommendations, particularly in the integrated modelling, and second, remaining issues in the measure-by-measure forecasts.

Improvements in the 2010 Plan: Definitions of Projected Emissions

In its 2009 KPIA Response, the NRTEE recommended that emissions reductions be consistently defined in the Plan. Specifically, it recommended that "to ensure emissions reductions can be accurately attributed to specific measures within a defined time period, and to facilitate comparison of emissions forecasts with actual emissions... the government forecast estimates of future emissions reductions in terms of changes in Environment Canada's GHG Emissions Inventory." The NRTEE defines an *emission reduction* resulting from a given policy or program as the difference between estimated emissions in the absence of the policy and estimated emissions including the policy. The integrated modelling in the 2010 KPIA Plan now consistently defines an emission reduction in this way, and as a result, the NRTEE agrees with the 2010 integrated modelling approach and methodology. The 2010 Plan, therefore, provides a reliable estimation of emission reductions under the integrated modelling.

Two specific changes in the Plan from previous years lead to this finding:

First, the *Turning the Corner* Regulatory Framework is no longer considered in the KPIA Plan. Previous NRTEE Responses suggested that forecasts of *regulatory emissions* — emissions net of compliance activities that firms undertake in response to the policies and programs under the Framework — should not be included in the Plan as compliance activities included actions that did not reduce actual emissions in the KPIA time period. This included contributions to a Technology Fund and credits for previous emissions-reducing actions (*early action*). As the Regulatory Framework is no longer included in the Plan, these issues are no longer of concern.

Second, the 2010 Plan shows greater transparency in accounting for emissions reductions from provincial policies. In the 2009 Plan, 16 Mt of reductions per year were assumed to result from provincial actions funded by the Trust Fund. The 2010 Plan now explicitly models provincial policies as part of the reference case in the integrated modelling so as to isolate the impacts of federal policies in inducing emissions reductions. Expected emissions reductions are estimated as the difference between a scenario of *projected emissions excluding federal government measures* and a scenario of *projected emissions including federal government measures*. This approach accounts for any interaction effects between federal and provincial policies. Further, the 2010 Plan also begins to assess how Trust Fund dollars transferred to the provinces are used to drive provincial emissions reductions. To inform the 2010 Plan, provincial governments were contacted, and some reported back as to what provincial programs were implemented with the Trust Fund dollars and the expected emissions reductions. The Plan explicitly recognizes that the Trust Fund will result in few reductions within the KPIA time frame. While unfortunately not all provinces responded to the government's inquiry, this section of the Plan increases transparency in terms of provincial actions and presents a more realistic picture of reductions likely to occur as a result of these actions.

In its 2009 KPIA Response, the NRTEE also recommended that "to continue the process to date of improving emission forecasting methodologies, measuring progress, and conducting effective policy evaluation... that future KPIA Plans reflect both emissions forecasts and actual emissions data documented in Environment Canada's GHG Inventory." The 2010 Plan now reports actual emissions levels in 2008 from the Inventory. Reporting actual emissions allows for comparison of actual emissions levels with previously estimated emissions. This comparison is useful for the ongoing evaluation of both policies and forecasting methodologies.

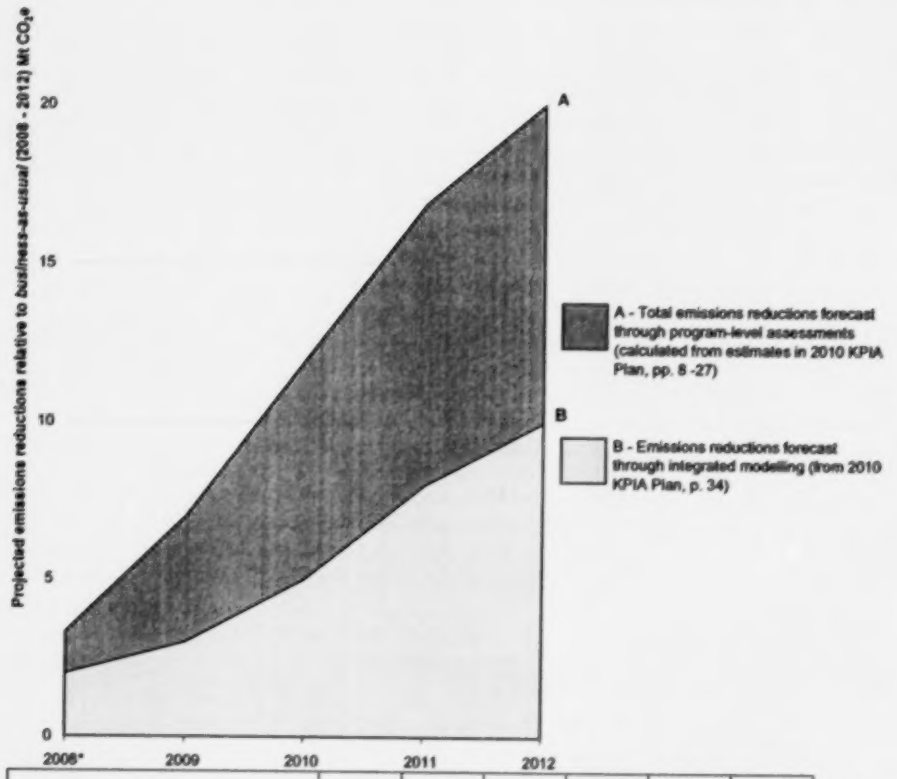
Remaining Issues in the 2010 Plan: Relationship between the Integrated and Program-By-Program Analyses

In its 2009 KPIA Response, the NRTEE recommended that "to ensure consistency in the approach to forecasting, to address the issues of *free-ridership*, *rebound*, and *additionality*, and to ensure greater transparency between forecasted emissions reductions on an individual measure-by-measure basis and those derived from integrated modelling... that future KPIA Plans apply more consistent methodologies between the two and provide more detailed and transparent explanation of differences between the integrated modelling forecasts and the program-by-program forecasts."

Since the Regulatory Framework is no longer included in the 2010 Plan, the remaining policies and programs have more prominence. Similar to previous years, concern still exists regarding consistency between the projections of emission reductions from individual policies and programs and the integrated modelling of the full suite of programs. As we have noted above, the NRTEE supports the forecasts from the integrated modelling in the Plan as being reliable which accounts for policy interaction, *additionality*, and *rebound effects*. However, when summed together, estimates from the individual policies and programs lead to larger total reductions than the overall number reported from the integrated modelling approach.

Figure 2 illustrates the difference between the two sets of emissions reduction projections based on a comparison of the two approaches to estimation. Curve *A* in the figure is calculated by adding up the reductions attributed to each individual measure in the measure-by-measure estimates contained in the 2010 Plan. Collectively, these estimates suggest approximately 20 Mt of emission reductions for 2012 are attributed to the full set of programs and policies included in the 2010 Plan. Curve *B* represents the estimated overall emission reductions from all programs and policies in the Plan as calculated by the integrated modelling. As the figure illustrates, the 2010 Plan forecasts that when implemented together, all the programs and policies in the Plan will result in about 10 Mt of emissions reductions in 2012. This discrepancy between the two approaches results from inconsistencies in how different programs and policies have been assessed as presented on an integrated modelling basis and on a measure-by-measure basis in the Plan. By the end of the Kyoto period, the total forecast emissions reductions would be 59 Mt on an individual measure-by-measure basis and 28 Mt on an integrated modelling basis.

Figure 2: Comparison of Total Emissions Reductions Attributed to Individual Measures in the 2010 KPIA Plan and Emissions Reductions of these Measures Projected Using Integrated Modelling, 2008 – 2012
(Data from or derived from 2010 KPIA Plan; both estimates include all policies and programs reported in the 2010 Plan)



	2008*	2009	2010	2011	2012	Total
A - Total emissions reductions forecast through program-level assessments (Mt CO_2e)	3	7	12	17	20	59
B - Emissions reductions forecast through integrated modelling (Mt CO_2e)	2	3	5	8	10	28

* estimated historical emissions reductions

Similar to its 2007, 2008, and 2009 Responses, NRTEE analysis suggests that some of this discrepancy between the integrated modelling and the program-by-program analysis is unavoidable due to *policy interaction effects*. However, the discrepancy could also be due to *free-ridership*, other *additionality* issues and *rebound effects* within each of the individual measure assessments. Appendix A assesses the individual KPIA forecasts for key programs and policies and finds that *rebound* and *additionality* are not uniformly considered across programs, and that many of the program-specific forecasts therefore likely overestimate emissions reductions as a result.[10]

Definitions for *Additionality* and *Rebound Effect*

Additionality Issues result when forecast emissions reductions do not reflect the difference in emissions between equivalent scenarios with and without the policy or program being assessed. If emissions reductions attributed to the policy would have occurred even in the absence of the policy, the reductions are not *additional*, and thus will be double-counted.

The Rebound Effect describes the increased intensity of use of a more energy efficient product. For example, more efficient cars are cheaper to drive and so people may drive them more, leading to fewer emissions reductions than forecast.

Additionality issues in particular are a key reason for the discrepancy between the integrated modelling and the individual, program-level forecasts. The integrated modelling framework produces reliable estimates of expected emissions reductions because these estimates are derived through forecasts of the economy with and without the policies in place. The baseline is very clear, and only incremental reductions due to the policies are counted and presented.[11] Forecasts for individual policies and programs do not, however, consistently account for emissions reductions in the same way. If the assessment does not explicitly and transparently consider what actions would take place in the absence of the policy or program, *additionality* concerns will exist. The greater the *additionality* concerns at the individual measure level, the greater the gap will be between the integrated estimates provided on page 34 of the Plan and the sum of the individual actions found throughout the Plan.

In order to put this issue into context, it is useful to consider the Office of the Auditor General of Canada's comments on ensuring that government programs induce actual change. While these comments are not explicitly focused on climate policy, they are nevertheless useful and relevant for program evaluation. In the OAG 's report, *Framework for Identifying Risk in Grant and Contribution Programs*,[12] the importance of judging the degree to which induced activities are incremental is emphasized. In the report, the OAG specifies that program managers should be able to provide justification for government involvement either through evidence that *"the project could not proceed, or not in the desired manner, without government funding,"* or that *"the funding is required to accelerate timing."* Each of these criteria suggests that, at both the design and evaluation phase, the question of whether any financed projects would have occurred absent the government financing is important. In assessing the impact of programs in terms of incremental GHG emissions reductions, the figures in the Plan should be supported by just the type of evidence cited by the OAG.

The NRTEE identifies two main options for addressing this issue and reconciling important differences between the integrated and program-by-program forecasts. First, the integrated modelling could be applied to consistently assess individual programs and policies. Second, the bottom-up methodologies currently used in the KPIA Plan could be improved. These options are explained below.

[10] It is important to recognize that individual programs and policies can have multiple policy objectives beyond emissions reductions, including providing public information, incenting technology adoption, or acting as a catalyst for other policy goals. In the context of the KPIA, however, we are assessing only one projected outcome of policies — forecasted emissions reductions.
[11] As indicated in the NRTEE's 2008 and 2009 Responses, the use of integrated modelling is an important improvement from the first KPIA Plan in 2007.
[12] Canada, 2001.

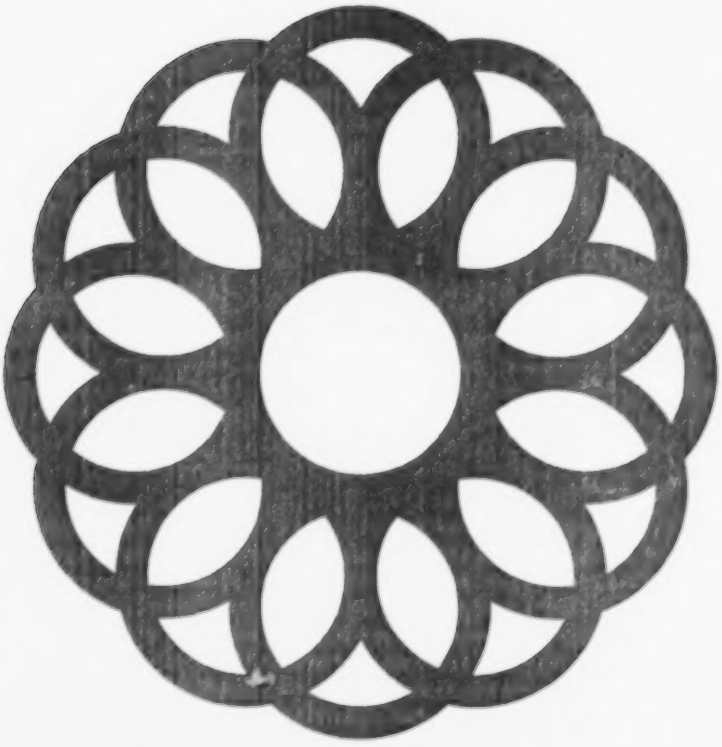
In previous NRTEE Responses, we have noted that the integrated modelling framework could be used to assess the contributions of individual policies and programs. Two practical approaches for using integrated modelling are possible. Each measure could be modelled individually using the integrated model. Alternatively, the integrated modelling analysis could assess how much emissions would increase if each individual measure was removed from the full suite of policies and programs, leaving all other measures in place. Either of these measures captures a type of marginal or incremental contribution. Environment Canada officials have noted that these approaches have limitations. While the NRTEE acknowledges there are limitations, this approach would nevertheless provide a consistent method for assessing individual policies and programs, and most importantly, would also address issues of *free-ridership*, *additionality*, and *rebound effects*.

Alternatively, the bottom-up approaches currently used in the Plan to assess individual programs and policies could be improved by transparently addressing *additionality* issues. Fundamentally, to be consistent with the integrated modelling forecasts, individual program and policy forecasts must estimate emissions reductions as the difference between a reference case that excludes the measure and a policy case that includes it. The reference case should clearly indicate would have happened in the absence of the policy. It should be credible, be based on reasonable assumptions, and be broadly consistent both with the integrated modelling and across estimates in the KPIA Plan. Adjusting the forecasts for individual programs and forecasts in this way would address the most important reason for the discrepancy with the integrated modelling.

Either approach is preferable to current methodologies, would be an improvement, and would address the important issues of *additionality* and *rebound* in the program-level estimates.

5.0

/ KYOTO OBLIGATIONS



5.0 KYOTO OBLIGATIONS

The KPIA requires the NRTEE to assess the likelihood that the proposed measures will enable Canada to meet its Kyoto obligations. According to the government Plan, "Canada expects to be 809 Mt above its Kyoto Protocol target of 2792 Mt during the 2008–2012 period."[13] The NRTEE considers this estimate reliable. Table 1 illustrates the gap between the Kyoto targets and expected emissions.

In order to be considered in compliance with the Kyoto Protocol in terms of total emissions, Canada's emissions must not exceed its total assigned commitment, except where this is offset through the use of approved flexibility mechanisms such as the Clean Development Mechanism. It cannot be concluded with absolute certainty that Canada will not be in compliance until after 2012 when final, actual emissions are inventoried and any use of international flexibility mechanisms is reconciled.

Table 1: Annual Allowable Units, Projected Emissions, and Excess Emissions over the First Commitment Period (2008–2012) Under the Kyoto Protocol [14]

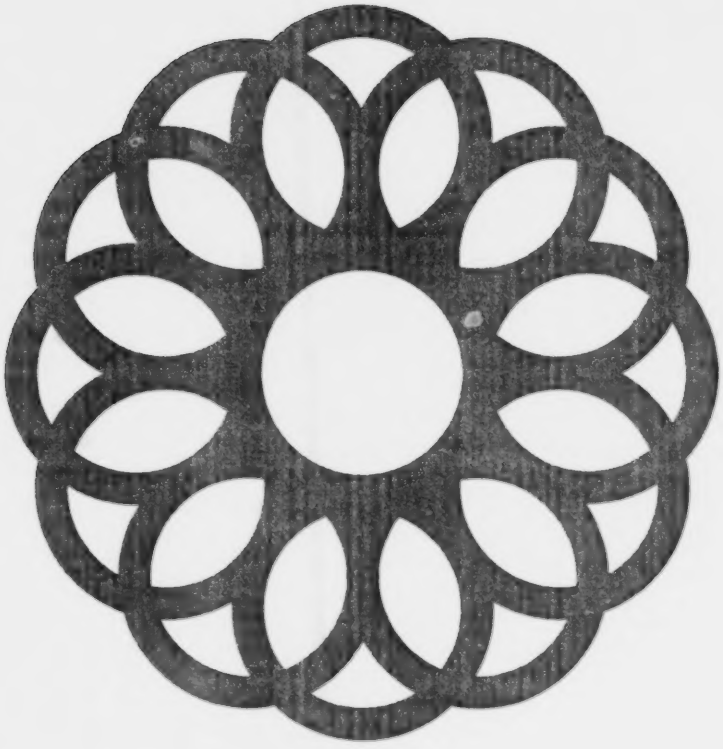
Year	2008	2009	2010	2011	2012
Allowable Emissions Under the Kyoto Protocol, 2008–2012 (Mt)	2792				
Kyoto Target (2008-2012 average) (Mt)	558				
Actual Emissions Projections (Mt)	734	701	718	720	728
Average Kyoto Gap (Mt/yr)	162				
Commitment Period Projected Excess Emissions (Mt)	809				

The change in overall forecast numbers in the 2010 Plan relative to the 2009 Plan reinforces the finding that final emissions cannot be determined until after 2012. Forecasts are uncertain and dependent on a range of assumptions, which are updated over time. In the 2010 Plan, forecasts of emissions are lower than in the 2009 Plan, even though the Regulatory Framework, the largest driver of emissions reductions in the 2009 Plan, is not included in the 2010 Plan. This change is largely due to lower economic growth forecasts; as described in the 2010 Plan,[15] the economy experienced larger than expected impacts from the recession in 2009 and recovery is expected to be slower through to 2012 compared to forecasts in the 2009 Plan.

[13] Canada, 2010a, p. 34
[14] *Ibid.*
[15] *Ibid.*

6.0

/ CONCLUSIONS AND RECOMMENDATIONS



6.0 CONCLUSIONS AND RECOMMENDATIONS

The NRTEE's analysis of the 2010 KPIA Plan leads to several conclusions.

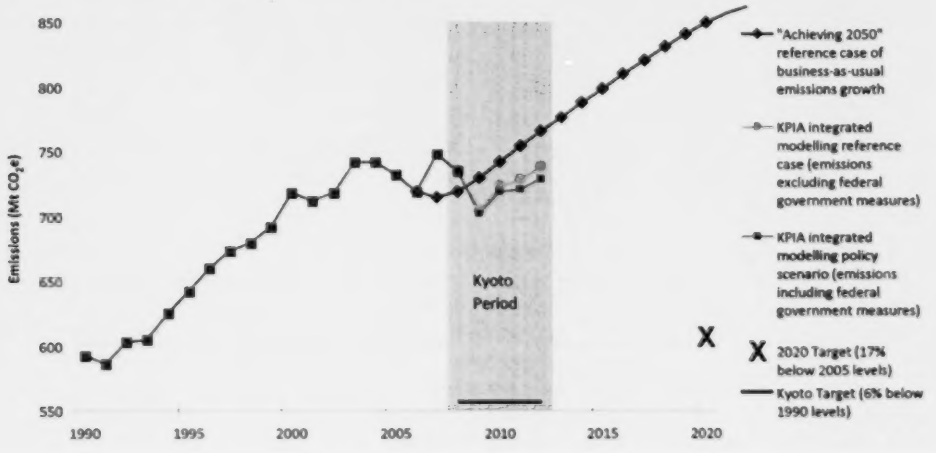
First, there have been significant improvements in the forecasts and methodologies included in the Plan. In particular, the integrated modelling in the 2010 Plan uses a consistent definition for emissions reductions and more transparently accounts for provincial policies by including them in the reference case. These changes lead the NRTEE to conclude that the integrated modelling in the Plan is a reliable estimate of likely emissions reductions in the KPIA period.

Second, similar to previous years, some inconsistency remains in the Plan between the forecasts for specific policies and programs and the integrated analysis of the full suite of programs. The program-specific forecasts collectively imply larger reductions than projected by the integrated analysis. Given that smaller programs now make up larger shares of the total emissions reductions forecast in the Plan with the exclusion of forecasted emissions attributed to the Regulatory Framework and Trust Fund, this inconsistency becomes more apparent in the 2010 Plan.

Third, as stated in previous KPIA Responses, the NRTEE believes there is value in broadening the process of evaluation to longer-term assessments. The 2010 KPIA Plan usefully compares the actual reductions resulting in 2008 to forecasts from previous KPIA Plans. This comparison of forecasts and actual results can allow for improvement of both forecasts and of program design over time. Over the longer term, similar, transparent processes are necessary to help track Canada's progress as it seeks to achieve its 2020 and 2050 emissions reductions targets.

Figure 3 below shows the KPIA integrated modelling forecasts in the context of Canada's 2020 target. It highlights projected emissions with and without federal programs and policies. The difference between these two trajectories is the projected emissions reductions attributable to federal policies. As illustrated in the figure, the forecasts indicate Canada will not achieve its Kyoto target. The figure also includes the *business-as-usual* emissions trajectory used by the NRTEE for its *Achieving 2050* Report, as no recently published *business-as-usual* trajectory exists. The difference between the KPIA and *Achieving 2050* Reference Case projections reflects the fact that since *Achieving 2050* was published, projections for economic growth (and consequently growth in emissions) are lower.

Figure 3: Comparison of GHG Emissions Pathways under Various Scenarios



The NRTEE applauds continued improvement in forecasting, methodology, and additional transparency provided by the government in the 2010 Plan. These improvements allow for more effective evaluation of policies and programs. To continue this cycle of improvement, the NRTEE makes the following recommendations:

1) In order to ensure consistency across all forecasts in the KPIA Plan, including the integrated modelling and measure-by-measure assessments from various government departments, the NRTEE recommends:

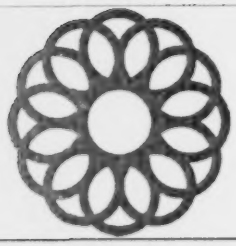
    a) that emissions reductions projections for each program and measure in the Plan be consistently estimated as the difference in expected GHG inventory emissions between a reference case without the measure in place, and a policy case with the measure in place; and,

    b) that consistent assumptions be used to define the reference case across all estimates.

2) To further improve transparency, the NRTEE recommends that the government make publicly available the details and underlying assumptions for both a consistent reference case and a policy scenario. These forecasts should be updated regularly and include details such as sector-level emissions projections. This data would enable better assessment of the impacts of policies on overall emissions levels, both in the Kyoto time period, and in the context of longer-term emissions reductions necessary for Canada to achieve its 2020 and 2050 targets.

3) To continue to improve Canada's emissions reduction policies, the NRTEE recommends that the current public process for evaluating climate policies be broadened beyond the context of the KPIA and focus on progress toward the government's stated 2020 emissions reductions targets based on a set of actual emission milestones. This is consistent with previous NRTEE recommendations that recognized that emissions reductions are a long-term policy goal and that policy measures need to be judged over time in terms of their effectiveness in delivering desired emission levels.

4) Recognizing the important role of provincial and territorial actions resulting from the CCAC Trust Fund and the importance of these measures to reducing Canada's GHG emissions, the NRTEE recommends that the federal government continue to co-operate with provincial and territorial governments in determining how the Trust Fund dollars are being invested and that provinces and territories provide necessary details, so it may be more fully determined how those investments and provincial policies are contributing to Canada's national emissions reductions objectives.



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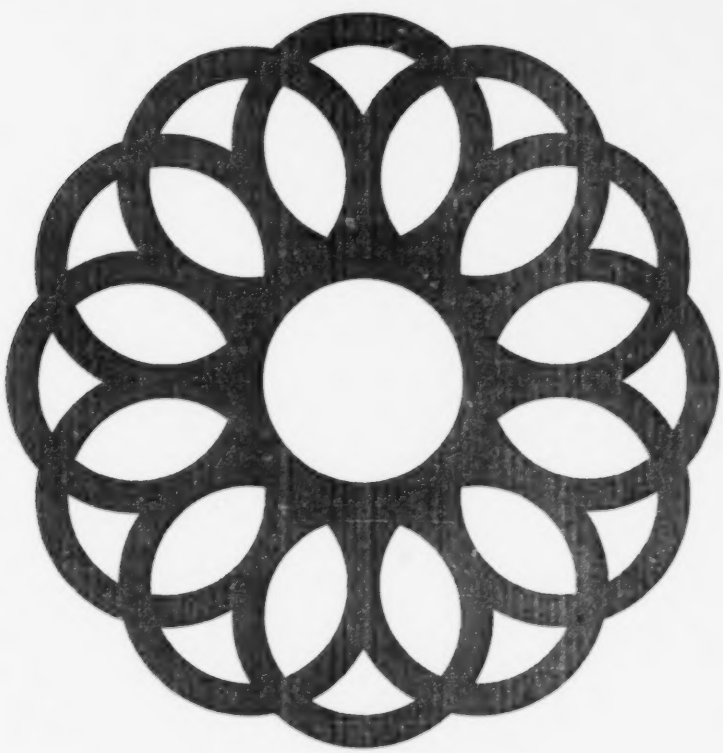
/ APPENDIX A: ANALYSIS AND ASSESSMENT OF INDIVIDUAL MEASURES



APPENDIX A: ANALYSIS AND ASSESSMENT OF INDIVIDUAL MEASURES

THE DERIVATION OF POLICY-BY-POLICY EMISSIONS REDUCTIONS

The 2010 KPIA Plan provides a breakdown of the expected emissions reductions associated with each individual policy or program aimed at or expected to have a role in reducing GHG emissions. The NRTEE's mandate includes the examination of the likely accuracy of these measure-level estimates in order to determine the likelihood of each program achieving the stated emission reductions. In general, approaches to estimating emissions reductions from individual measures continue to be subject to the same critiques as have been brought forward in previous NRTEE Responses.

This appendix provides detailed analysis of policies and programs with estimated emissions reductions of more than 1 Mt/yr on average for the years in which the policy or program is in place. As in previous years, the results with respect to the likely accuracy of predicted emissions reductions are mixed. Several programs are evaluated in a manner consistent with previous NRTEE recommendations. Three main factors contribute to the overestimation of emissions reductions for some estimates of emissions reductions for individual policies. First, some estimates are subject to concerns about *additionality* as estimates report more than just the incremental emissions reductions due to the measures. In these cases, actions that would have occurred, absent the programs, are treated as part of the programs' effects. Second, evaluations of some policies do not incorporate the *rebound effect*. Third, the individual programs are evaluated without considering possible interaction and economy-wide effects.

Table 2 provides a summary of the projected emissions reductions provided in the 2010 Plan for individual policies and programs assessed by the NRTEE. This Appendix assesses each of these forecasts in turn.

Table 2: Reported GHG Emissions Reductions for Program-by-Program Estimates Assessed by the NRTEE from the 2010 KPIA Plan (Mt)

	Projected emissions reductions (Mt)						Average (Mt /yr)
	2008	2009	2010	2011	2012	Total	
Regulating Cars and Light Trucks	0	0	0.2	0.8	1.5	2.5	0.50
Energy Efficiency Regulations	0.09	0.23	0.61	1.08	2.99	4.99	1.00
Regulating Renewable Fuels Content	0	0	0.19	1.98	2.01	4.18	0.84
ecoENERGY for Renewable Power	1.35	2.6	4.7	6.0	6.0	20.65	4.13
ecoENERGY for Buildings and Houses	0.58	0.98	1.26	1.49	1.81	6.12	1.22
ecoENERGY Retrofit Initiative	0.39	0.67	1.72	1.94	1.94	6.66	1.33
ecoENERGY for Industry	0.64	1.03	1.44	1.54	1.54	6.19	1.24
Remainder of Policies and Programs	0.28	1.49	1.84	2.06	2.27	7.93	2.64

1.1 REDUCING GREENHOUSE GAS EMISSIONS FROM NEW CARS AND LIGHT TRUCKS

Table 3: Summary of Analysis for Reducing Greenhouse Gas Emissions from New Cars and Light Trucks

Program	Projected Emissions Reductions in Mt					Key Determinants of Results	Predictive Accuracy
	2008	2009	2010	2011	2012		
Reducing Greenhouse Gas Emissions from New Cars and Light Trucks	0	0	0.2	0.8	1.5	-model-based estimate of emissions reductions relative to status quo -accounts for *rebound effect* -no accounting for changes in vehicle sales -flexibility mechanisms not included in analysis	Likely overestimate
Change from 2009	N/A	N/A	N/A	N/A	N/A		

Summary of Initiative and Emissions Reductions

Announced in the *Canada Gazette* on April 17, 2010, the proposed regulations would require that vehicle manufacturers and importers meet fleet average GHG emission standards for their passenger automobiles and light trucks for the 2011 and later model years. These regulations are harmonized with new standards being imposed in the United States. The goal of the regulations is to impose an industry-wide average fuel efficiency standard of 35 miles per gallon for passenger cars and light-duty trucks by 2020. The regulations are new, so no changes from the 2009 Plan are presented.

It is expected that the proposed regulations will be refined as part of the *Canada Gazette* process. The NRTEE's analysis is based on the proposed regulations published in the *Canada Gazette* as referenced in the 2010 Plan, and the forecasted emissions reductions in the Plan. As design of the regulation evolves, projections of expected emissions reductions will change.

Analysis

The analysis of this program provides estimates of the emissions reductions likely to occur in Canada as a result of the new, harmonized regulations between Canada and the U.S. The modelling performed by Environment Canada predicts vehicle emissions in both a reference case and a policy case, and reports the annual difference in predicted emissions between the two scenarios. The model includes potential increases in kilometres driven in new, more fuel-efficient vehicles.

There are three sources of potential discrepancy between these estimates of emissions reductions resulting from the regulations as described in the *Gazette* and what will actually be observed. First, like the previous Regulatory Framework for Air Emissions, the vehicle emissions regulations provide companies with flexibility options for compliance that do not require improvements in the emissions efficiency of vehicles. The analysis does not account for the use of these credits, and so likely overestimates actual emissions reductions. Second, the analysis assumes that there is no impact on vehicle sales even though price increases may exceed 5%. If the regulations slow vehicle turnover, the realized emissions reductions will be lower than predicted. Third, the reference case used to assess the impact makes conservative assumptions for future progress in efficiency, but the effect of this assumption is difficult to assess. Each of these is discussed in turn below.

According to the Regulatory Impact Analysis Statement (RIAS) published in the *Canada Gazette* on April 10, 2010, manufacturers are expected to meet the fleet average GHG emission standards primarily by introducing improved GHG-reducing technologies to new vehicles or may also pursue other changes, such as shifts in the sales mix among vehicle models and between cars and light trucks. While this outcome is possible, the regulation also offers flexibility options for compliance. The April 17, 2010, RIAS states that "the proposed Regulations would include a system of emission credits to help meet overall environmental objectives in a manner that provides the regulated industry with additional compliance flexibility." Compliance flexibility in this case implies that firms may make payments in lieu of emissions reductions. According to the RIAS, "For the 2011 model year only, a company may offset an emission deficit incurred with an equivalent number of credits obtained by payment to the Receiver General of Canada at a rate of $20 per tonne of CO_2e emissions." For the 2011 model year, this flexibility mechanism implies that firms may pay a fee and maintain *business-as-usual* emissions, or may not reduce the emissions per kilometre of their fleet by as much as predicted while remaining in compliance with the regulation.

The regulation also contains provisions for credits for early action. Credit for early action, according to the RIAS, "recognizes early action and good performance during the preceding years and allows for the option of banking credits to help a company comply with its applicable fleet average emission standards beginning with the 2011 model year." In terms of measuring reduction in actual emissions, every credit issued for early action will allow a company to remain in compliance with regulations while doing less than it would otherwise have to in terms of emissions efficiency improvements during the 2011 period and onward. The modelling performed to assess the impacts of these regulations did not account for any potential erosion of actual emissions reductions realized during the Kyoto period resulting from the issuance of credits for early action. Any credits that are issued and used before 2013 will lead to lower than predicted emissions reductions during the Kyoto period.[16]

The final element of the flexibility mechanisms — which is relevant for the KPIA Plan more than it would be for assessing the overall impact of the regulation — is the provision that allows firms to exceed their compliance thresholds in the early years and to effectively *pay back* the deficit through future over-compliance. Since the United Nations Framework Convention on Climate Change (UNFCCC) reporting framework looks at actual emissions during the Kyoto period, any credits that may be issued in the future for compliance and counted against emissions in the Kyoto period would not be reflected in Canada's emissions inventory. So, while the regulation assures that emissions reductions (or at least emissions efficiency improvements) will occur during the compliance period, the flexibility mechanisms that allow for carry-forwards and carry-backs mean that emissions reduction activities in any given year are uncertain. The degree to which companies do not meet (or over-comply with) their emissions efficiency requirements in the initial years of regulation enforcement will determine the actual effect on Kyoto-period GHG emissions.

The emissions reductions expected to occur are calculated as the difference between a reference case and an impact case using an engineering model. Since the reductions are calculated relative to a reference case, the assumptions underlying the calculation of what would have happened without the regulation in place should be examined. The current Environment Canada reference case reflects an expectation for relatively stable oil prices and thus limited non-policy-induced evolution in the average fuel economy. The combined car and light truck reference case assumes an improvement from 322.3 gCO_2/mile in 2011 to 321.1 gCO_2/mile in 2016.[17] The calculation of a reference case for fleet average vehicle fuel economy is challenging, and there is no single clear answer. In fact, the hypothetical answer to what vehicle technology will (or would have) looked like absent regulation can never be known once the regulation is passed. In the case of vehicles, the key variable likely to affect technological progress is energy prices. In the 2000–2008 period, we saw sustained and nearly unprecedented increases in the costs of fossil fuels, and this resulted in marked decreases in fleet average fuel consumption in Canada. Conversely, the 1990s saw stable real oil prices and significant increases in fleet average fuel consumption. Recent

[16] The RIAS published on April 17, 2010 states that credits obtained over the 2008–2010 period could be used to comply with the 2011 model year fleet average GHG emission standards. Credits obtained over the 2009–2011 period could be used to comply with the fleet average GHG emission standards for the 2012 and later model years.
[17] Lawson, 2010.

analysis from transport industry analyst Desrosier Automotive Consultants Inc. suggests Canadian vehicle fuel efficiency may be trending downward given relatively stable oil prices.[18] In any case, given that the Kyoto timeline is short, the impact of this assumption will be relatively small within the Kyoto period, since the vehicles that are to be introduced between now and 2012 are known with relative certainty. The degree to which the fuel economy of these vehicles was chosen in response to expectations about future policies is speculative; however, the U.S. has been contemplating an update to the CAFE standards for many years.

To analyze induced changes in emissions in the impact case, forecasts for vehicle sales by brand are tabulated. There is a concern here since, according to Environment Canada's RIAS, the analysis employed assumes there is no impact on vehicle sales resulting from the increases in cost which Environment Canada has stated will be required to meet the standard. Since any emissions reductions that occur do so because of stock turnover rates in vehicle inventories that replace older, less-efficient vehicles with newer, more-efficient ones, impacts on sales are important. The Plan acknowledges this assumption, but suggests its effects will be minimized, "because the value of fuel savings over the first year of driving outweighs the expected cost increase for the average vehicle." However, the assumption is made for reasons of model compatibility. The RIAS states, "in reality, relative changes in vehicle prices and performance may impact consumer choice; however, it is not within the capacity of OMEGA to model consumer choice." Importantly, analysis done for the Green Levy and the ecoAUTO Rebate Program since 2007 by Transport Canada incorporates a model with the resolution to capture the impact of vehicle cost on consumer decisions. Extensive academic literature exists exploring the impact of operating cost on consumer purchase decisions that might allow the uncertainty bands for the estimated emissions reductions to be adjusted. While any change in consumer sales is important in assessing the impact of the regulation, it is not possible to say whether the availability of more expensive but also more efficient vehicles than would otherwise have been available will lead to increases or decreases in sales without extensive study.

Conclusions

Overall, the impacts of this regulatory change are forecasted in large part in accordance with previous recommendations by the NRTEE. However, two of the concerns above necessitate the conclusion that the provided estimates are likely overestimates of the reductions in actual emissions relative to the status quo. The flexibility mechanisms allow firms to meet their regulatory burden either through fleet average emissions reductions, through payments in lieu of such actions in 2011, or through the retirement of any received credits for early action. The expected use of flexibility mechanisms must be transparently reported and be consistent with the thresholds for use of the mechanisms as defined in the Regulation. If any flexibility mechanisms are expected to be used, emissions reductions will likely be overestimated. Further, the analysis does not tabulate reductions in vehicle sales that may slow the penetration of new vehicles into the marketplace. Consultation between Environment Canada and Transport Canada could help ensure that estimates of the effects of these regulatory changes and the induced cost and efficiency increases on vehicle sales can be clearly calculated.

This regulation will result in emissions reductions within and outside the Kyoto period. An assessment at this stage of the program should not be read as concluding an overestimate for the program as a whole as final details remain to be determined through the *Canada Gazette* process. The forecast is based on a preliminary regulation design that will likely change, resulting in different future forecasts. Therefore the NRTEE's analysis of a likely overestimate at this stage may be less material to final overall emissions reductions. Responsiveness to the issues raised in this assessment will help determine the reliability of future forecasts for the final estimates of emissions reductions once the regulation is finalized.

[18] Globe and Mail, 2010. http://www.theglobeandmail.com/report-on-business/green-fades-in-vehicle-purchase-choices/article1628059/

1.2 ENERGY EFFICIENCY REGULATIONS

Table 4: Summary of Analysis for Energy Efficiency Regulations

Program	Projected Emissions Reductions in Mt					Key Determinants of Results	Predictive Accuracy
	2008	2009	2010	2011	2012		
Regulating Energy Efficiency	0.09	0.23	0.61	1.08	2.99	-results do compare a *business-as-usual* to a policy case -no *rebound effect* or sales adjustment	Likely overestimate
Change in Projected Emissions Reductions from 2009	0	-0.03	-0.14	-0.32	-0.56		

Summary of Initiative and Emissions Reductions

The estimates in the 2010 Plan for emissions reductions due to Energy Efficiency Regulations include the effects both of energy efficiency standards for a range of products and energy-efficiency labelling under the EnerGuide and ENERGY STAR programs. The government has registered updates to existing standards for 12 product categories, and has introduced or pre-published new energy efficiency standards for 20 more that have or will have taken effect between 2007 and 2010. The new regulations imply an effective ban on incandescent light bulbs that would begin in 2012. A proposed regulatory amendment was published in the *Canada Gazette*, Part I, on March 29, 2008, and the Amended Regulations were published in the *Canada Gazette* on December 12, 2008. Further regulatory changes have been pre-published as of June 12, 2010 in the *Canada Gazette*. The changes to expected emissions reductions from previous years reflects changes in timing for some of the regulations announced in the June 12, 2010, RIAS.

Analysis

The government's analytical framework has not changed appreciably since 2008. According to the methodological document provided by NRCan for the purposes of this evaluation, the emissions reductions provided in the Plan were calculated through analysis of the market share of products currently permitted that would not be in compliance with the new standard. Emissions reductions are then calculated, assuming that the sales of these products would translate to sales of new appliances that do meet the standard. The Regulatory Impact Analysis Statements (RIAS) for the first set of amendments published in the *Canada Gazette*[19] and the pre-publication of the second set of amendments[20] also provides estimates of the impact of these regulations. Combined, these documents report 2010 emissions reductions of 0.5 Mt for 2010, which is slightly different than the 0.61 Mt reported in the Plan. The Plan states that for the purposes of the KPIA, "impacts for equipment labelling programs are estimated as a percentage (30%) of regulatory impacts, based on program analysis." This explains the differences in figures reported in the RIAS and *Canada Gazette* and those reported in the Plan.

[19] Canada, 2008c.
[20] Canada, 2010d.

To calculate the impact of a regulatory change for energy efficiency of appliances, estimates should consider the following:

1) The number and energy consumption ratings of appliances that would have been in use without the regulatory change.

2) The number and energy consumption ratings of appliances that will be in use after the regulatory change.

3) Whether any change in usage patterns occurs as a result of the new regulation.

The estimates provided in the Plan provide reliable estimates of 1 and 2, but do not fully account for 3.

Both the KPIA Plan estimates and the RIAS estimates of emissions reductions from these programs present a *business-as-usual* case and compare it to an impact case. As such, the estimates are consistent with a measurement of the annual reductions in emissions that would be expected to result from these changes. There are two mitigating issues. First, the estimates do not account for any income or substitution effects that may occur as a result of the regulation. Second, no consideration was explicitly given to the *rebound effect*. Combined, these omissions would likely lead to an overestimate of emissions reductions. However, a 15% adjustment factor that the estimate uses to account for "risks to the outcome" is likely sufficient to broadly account for these issues. Both issues are discussed in turn below.

The analysis of these regulatory changes assumes that sales of non-compliant (inefficient) products will simply be replaced with sales of compliant (more efficient) products. There are cases where this might not be true. First, if compliant products are more expensive, some consumers may decide to shift their consumption dollars to an entirely different product as opposed to a compliant product of the same type. In other words, the number of compliant air conditioners sold after the change in regulations may not be as high as the sales of all air conditioners would have been absent the regulatory change. This effect results in ambiguous consequences for emissions reductions. If the decrease in sales occurs because people decide not to replace their older (and even less efficient) models due to the increase in cost, then the regulatory change could prevent some improvements that would reduce its impact on emissions. Conversely, if increased costs prevent someone from purchasing a first air conditioner when they otherwise would have, induced emissions reductions are increased. Additionally, people who decide not to purchase a certain appliance due to the new regulation could use the savings for a different purchase that could have either positive or negative net effect on energy use. These effects are likely to be small for most products and will be accounted for in the integrated modelling of the overall impacts of the policy package.

To understand the effects of these regulations, the first step is to know how many appliances of each type will be sold and used after the regulation is imposed as compared to before. Next, estimates should also consider whether the intensity of use will change. If more-efficient appliances are larger or are used more intensively, the energy savings accruing over a year will be less than the difference in efficiency between compliant and non-compliant units. This effect is called the *rebound effect*. There is also the possibility that the new device will replace the old one, but that the old device will be used elsewhere in the home; in the 2008 NRTEE Response, this was denoted as the *beer fridge* effect. In this case, the purchase of the new appliance will increase household energy consumption rather than reduce it (unless the household also replaces an even older beer fridge). It is unlikely that standards that require more efficient products to be sold will alter households' secondary use of appliances, but there is consistent

evidence that people make more use of more energy efficient appliances because they provide cheaper heat, cheaper clothes washing, or more room for cold food.[21]

The estimates provided for the emissions reductions from regulatory policies do an excellent job of accounting for the rate of capital turnover in the primary appliance stock. Further, the estimates provided by NRCan are decreased by a factor of 15% from the computed values to "accommodate risks to the outcome." This risk factor would likely be sufficient to accommodate overestimation due to the *rebound effect*. However, as there are empirical studies of *rebound effects* for most of the regulated products including residential heating and clothes washers, and these estimates are not consistent across all product groups, it would be desirable for these to be included specifically.

The second main elements included in this estimate are the EnerGuide and ENERGY STAR labelling programs. Consumer awareness plays an important role in driving energy-conscious behaviour. Both EnerGuide and ENERGY STAR labels are household names in Canada, and Canadians do take these labels into account in purchasing decisions. To what degree they do so is speculative, but recent work published in *Energy Policy* by Sanchez et al. (2008) estimates the cumulative impact of ENERGY STAR labels in the U.S. to be about 100 Mt CO_2/year. NRCan has compiled survey evidence to suggest that labels account for energy savings equivalent to 30% of the effects of regulations. This estimate may be optimistic: as regulations get tighter, the impact of labels would likely decrease as most products on the market are at the higher-efficiency end of the spectrum. Of further concern is the fact that ENERGY STAR is an international labelling initiative. NRCan promotes the international ENERGY STAR symbol in Canada and monitors its use. As such, it would be inaccurate to claim that all the benefits of ENERGY STAR labels in the marketplace are due to the actions of NRCan.

Note that an additional labelling program, the EcoLogo Program, which is licensed but not operated by the government, is not assessed in the KPIA Plan.

Conclusions

Overall, the impacts of the energy-efficiency regulatory changes are broadly well-evaluated. Small improvements in accuracy could be made by adding individual *rebound effect* calculations for each type of good considered, and by considering the impact of any increased costs in terms of potential delays or substitution of sales away from the product type in question. In contrast, the emissions reductions induced by the labelling programs are likely overestimated given that energy efficiency improvements would have occurred even in the absence of the labels. Further, the international ENERGY STAR label would have resulted in improvements even in the absence of NRCan's participation in the program. Future KPIA Plans could provide increased transparency and reliability of estimates by separating expected emissions reductions from the energy efficiency regulations and from the labelling programs.

[21] Empirical evidence cited in the 2007 and 2008 NRTEE Responses suggests that the *rebound effect* is important. A study by Davis (2007) shows that when randomly chosen homeowners are given washers that are on average 48% more efficient in terms of energy use, total resulting energy (and emissions) reduction is just 42.4% rather than 48%. Additional studies by Hausman (1979), Dubin and McFadden (1984), Dubin (1985), Dubin, Miedema, and Chandran (1986) show similar patterns of increased usage intensity after the acquisition of more-efficient appliances. As NRCan documentation suggests, program design and messaging can only partially offset these behavioural changes, and so an adjustment factor should be included to address the residual effect.

1.3 REGULATING RENEWABLE FUELS CONTENT

Table 5: Summary of Analysis for Regulating Renewable Fuels Content

Program	Projected Emissions Reductions in Mt					Key Determinants of Results	Predictive Accuracy
	2008	2009	2010	2011	2012		
Regulating Renewable Fuels Content	0	0	0.19	1.98	2.01	-renewable fuels' emissions reductions factor -import and export market -effects of U.S. LCFS -uncertain implementation of biodiesel requirements	Undetermined[77]
Change in Projected Emissions Reductions from 2009	0	0	-0.11	0.98	-0.09		

Summary of Initiative and Emissions Reductions

Regulations will require 5% renewable fuel content by volume for gasoline from 2010 and may require 2% renewable fuel content by volume for diesel fuel and heating oil, as announced in the *Canada Gazette*.[78] The change in estimated emissions reductions for 2011 reflects an expectation that biodiesel regulations will be imposed by that time.

Analysis

The projections in the 2010 Plan are derived by comparing a reference case with an impact case to assess the incremental volumes of biodiesel and ethanol likely to be produced. Emissions reductions are calculated using conversion factors that specify the amount by which total GHG emissions are reduced when gasoline and diesel are produced from biomass rather than from petroleum. The 2008 Plan improved on the 2007 Plan to reflect only incremental volumes produced as a result of the regulation, and this improvement was preserved in the 2009 Plan. The 2010 Plan provides detail of the emissions reductions factors used and is complemented by the publication of the RIAS for the ethanol requirements.

The 2009 NRTEE Response found that four key sources of uncertainty surround the impact of this regulation. First, how the ethanol and biodiesel is produced will have a substantial impact on the emissions reductions. Second, where the ethanol and biodiesel is produced could have an impact. Third, and perhaps most importantly, the effect of an increase in ethanol and biodiesel on domestic production and consumption of gasoline and diesel will determine the induced reductions. Finally, this year the publication of the April RIAS raises additional uncertainty for the estimate, given that there is no commitment to the implementation of the biodiesel requirement during the Kyoto period. Each of these is discussed in turn below. We also note an example of best-practices with respect to the treatment of overlapping provincial and federal programs.

The emissions reduction factors used in the Plan define assumptions as to how renewable fuels are produced. The factors used are those employed by the GHGenius model, and are broadly consistent with estimates used by the U.S. EPA and the California Air Resources Board. The emissions reduction factors used in the 2009 Plan suggest that ethanol and biodiesel production respectively lead to 33.1% and 66.5% reductions in GHG emissions relative to production of gasoline and diesel from fossil fuel sources. These figures are comparable, albeit slightly higher, than the expected values reported for the California

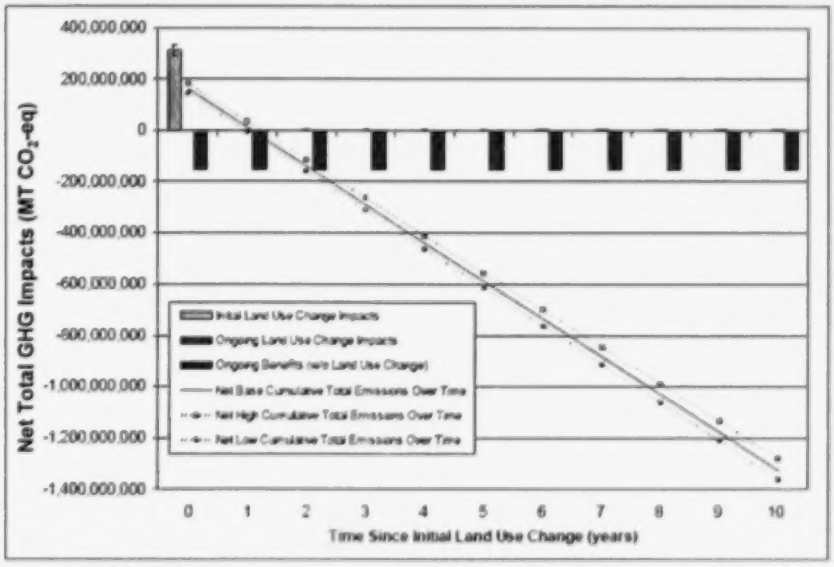
[77] As described in this section, multiple sources of uncertainties could result in actual emissions reductions from this program being either lower or higher than the forecast.

[78] The Regulatory Impact Analysis Statement for the Renewable Fuels Regulations (Canada, 2010b) states that the biodiesel requirement would only be brought into force once the technical feasibility of renewable diesel fuel used under a range of Canadian conditions has been demonstrated. No expected date was provided for this implementation.

low-carbon fuel standard (LCFS) of 17% and 58% for ethanol and biodiesel respectively. The EPA indicates substantial variability in the reduction in life-cycle GHG emissions depending on the type of renewable fuel production.[24] For example, corn ethanol life-cycle GHG reductions vary from +19% to -47% relative to gasoline depending on the plant type and electricity source used.

The emissions reductions estimates provided in the Plan do not account for any increase in emissions due to land-use changes, and therefore could overestimate emissions reductions.[25] This approach is inconsistent with studies that have compiled evidence to suggest that emissions reductions from biofuel production may not be as large as previously estimated once induced indirect land-use changes are tabulated in the estimates.[26,27] As shown in Figure 4, the EPA (2010) reports that the vast majority of increased emissions from land-use change are expected to occur in the first years of the regulation. The U.S. Renewable Fuel Standard is expected to lead to 64 billion litres of new renewable fuel production in 2010, and the EPA estimates that the initial indirect land-use changes will produce 331 Mt of emissions. Given that Canada expects increased demand of only about 0.8 billion litres of renewable fuel, the scale of land-use change would also be much smaller. However, if we assume that emissions due to land-use changes will occur at the same rate in Canada as in the U.S. per volume of renewable fuel produced, the U.S. figures would imply a one-time impact during the Kyoto period of approximately 4.1 Mt. While small in terms of the long-term impact of a renewable fuel content standard (estimated in the RIAS to be 23 Mt between 2010 and 2034), this effect is significant enough to potentially nullify all of the emissions reductions that the Plan expects during the Kyoto period. This issue could be addressed through an analysis of the likely front-end land-use impacts to be felt once the regulations go into effect in the 2010 and 2011 growing seasons as these effects will show up in Canada's emissions inventories during the Kyoto period. Not including any impacts in the estimates provided in the Plan likely leads to an overestimate of the induced emissions reductions.

Figure 4: GHG Impacts Over Time from U.S. Renewable Fuel Standard (Source: EPA, 2010)



[24] EPA, 2010.
[25] Canada, 2010b, p. 767.
[26] Indirect land-use changes capture the potential that total agricultural land will increase in order to meet demand for biofuel feedstocks. This is in contrast with direct land-use changes that centre on crop-switching to biofuel feedstocks from other agricultural production.
[27] See Farrell *et al.* (2006), Liska *et al.* (2009), Hill *et al.* (2006), and Searchinger *et al.* (2008) for details on life-cycle emissions from biofuels and fossil fuels.

The extent to which renewable fuels are imported could alter the effects of the regulations on the Canadian GHG Inventory. As acknowledged in the RIAS, significant quantities of renewable fuels may need to be imported from the U.S. in order to meet the content standards until a suitable expansion in domestic capacity is achieved.[28] Imports are important to consider because the production of renewable fuels, while often producing fewer emissions than the production of gasoline from fossil fuel sources, still produces positive net GHG emissions. Under the standards set out for reporting under the Kyoto Protocol, only emissions that occur within Canada's borders, not emissions associated with imports, are included in the emissions inventory. So, the proportion of imported fuel will determine the degree to which emissions inventories would be affected in Canada since all of the electricity for production and any induced land-use changes associated with imported fuel production would be taking place in the U.S.

Assumptions as to how ethanol (and eventually biodiesel) requirements will reduce domestic refinery activity and/or crude oil production can also affect the impacts of the Renewable Fuels regulation. In order to reduce inventoried emissions, the requirement must alter the *business-as-usual* production of gasoline or diesel fuel, displacing some of this production with lower emissions renewable fuels production. There is some indication that this would be the case, although no conclusive statement is included in either the Plan or in the RIAS. For example, the EPA (2010) analysis finds that "2/3 of a reduction in petroleum gasoline demand would be met by a reduction in imported gasoline...while the other 1/3 would be met by reduced refining production by the U.S. refining sector." In Canada, the question is what share of reduced domestic demand for gasoline would be offset by increased exports versus by decreased production. Given that the U.S. policy coming into force at the same time seems set to reduce demand for Canadian gasoline, it seems likely that some of the displaced demand would be met through a reduction in refinery production of gasoline in Canada, resulting in some reduced refinery emissions in Canada. Subsequent analysis to establish estimates of the impact of displaced demand for gasoline on the Canadian refining sector could address this issue.

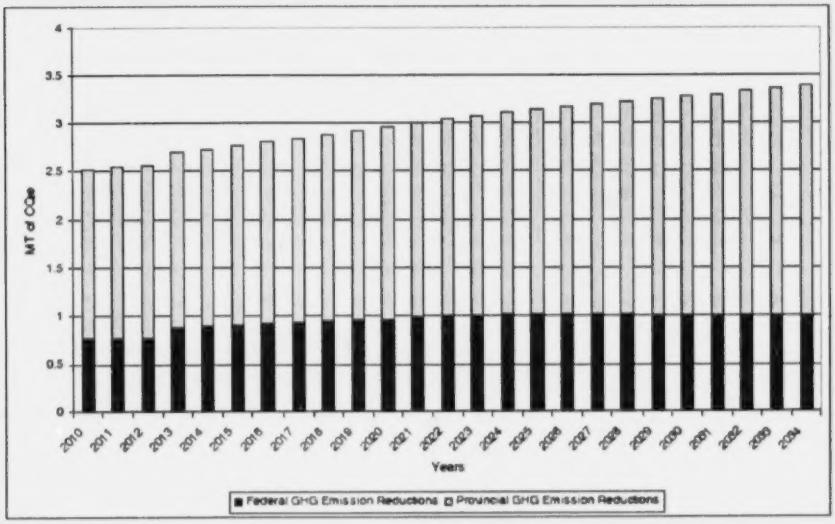
Tailpipe emissions from automobiles may increase or decrease depending on the impact of the renewable fuel standard at the gas pump and in the gas tank. The impact of the regulation on the total consumption of blended gasoline and diesel is ambiguous. First, as stated in the RIAS, "costs to consumers are expected to total $2 billion resulting from increased fuel consumption due to the lower energy content of ethanol-blended gasoline...on a per-vehicle basis, the average annual impact on consumer expenditure on gasoline is estimated to be $34 for 2011." Gasoline markets are almost perfectly inelastic in the short term, and more elastic in the long term. As such, we would expect most of the costs in the short term and some of the costs in the long term to appear in the price at the pump. Environment Canada estimated the high end of the range of potential increases in price at "0.07¢/L in provinces like Ontario where a provincial mandate is already in place to 0.30¢/L in Quebec and the Atlantic Provinces where renewable fuel requirements are not in place." As such, motor vehicle fuel will become marginally more expensive. We would thus expect that consumers would drive marginally less (an inverse to the *rebound effect* discussed above), and therefore use slightly less fuel than would be predicted by simply looking at the volumes of production required to meet the standard and continuing to drive as we otherwise would.

Finally there remains significant uncertainty with respect to the date of imposition of the proposed requirement for biodiesel. The RIAS published only the regulatory impact of the 5% ethanol requirement, while stating that the biodiesel requirement will only be brought into force once the technical feasibility of renewable diesel fuel use under a range of Canadian conditions has been demonstrated. The RIAS reports emissions reductions of approximately 0.75 Mt/year attributable to the 5% gasoline blending standard. Since it is not certain that the biodiesel requirement will come into force during the Kyoto period, at a minimum the low-end estimate for the impact of the combined regulation should have reflected this uncertainty. However, a better approach to reflect the uncertainty attributed to the biodiesel requirement would have been separate reporting on these two measures in the KPIA Plan, with explicit statements on the likelihood of the imposition of the biodiesel requirement.

[28] Canada, 2010b, p. 757.

As an additional point, several provinces have introduced requirements for renewable fuel content within their jurisdictions, complicating the analysis of the impact of the federal program. The assumption Environment Canada made to establish the figures in the Plan is that the federal regulations will induce new production in provinces that either had not announced provincial regulations or have since announced regulations comparable to the federal regulations. Those volumes are attributed to the federal mandate and thus are included in the calculations. Volumes of renewable fuel production required to meet provincial mandates that were announced before the federal government announced its policy are not attributable to the federal mandate. Figure 5 illustrates this breakdown, showing expected contributions of both federal and provincial renewable fuel policies. It is certainly possible that the federal mandate, by requiring capacity in all areas of the country, will make some of the earlier provincial mandates harder to meet, requiring more incremental production to meet volumes in those jurisdictions. As such, this approach may underestimate the impact of the federal regulations, and is not likely to overestimate it.

Figure 5: Estimated Contributions to Emissions Reductions from Federal and Provincial Renewable Fuel Requirements (Source: *Canada Gazette*, 2010)[23]



Conclusions

As in previous Plans, the key question with respect to the biofuels standard is the emissions reduction factor applied to the incremental volume of ethanol and biodiesel consumption in Canada. The figures used in the Plan may be either high or low depending on the eventual impact of the standard on biofuel production in Canada and the activity in the refined products sector in Canada. Given these uncertainties, the accuracy of the Plan's estimate with respect to the impact of the renewable fuel content standard could not be determined.

[23] Canada, 2010b, p. 758.

1.4 ECOENERGY FOR RENEWABLE POWER

Table 6: Summary of Analysis for ecoENERGY for Renewable Power

Program	Projected Emissions Reductions in Mt					Key Determinants of Results	Predictive Accuracy
	2008	2009	2010	2011	2012		
ecoENERGY for Renewable Power	1.35	2.6	4.7	6.0	6.0	-additionality -free-ridership -interaction with provincial policies	Likely overestimate
Change in Projected Emissions Reductions from 2009	-0.85	-1.14	-0.75	-0.67	-0.67		

Summary of Initiative and Emissions Reductions

The ecoENERGY for Renewable Power program provides an incentive of one cent per kilowatt hour for up to 10 years to reduce the cost gap between new technologies and traditional sources of electricity. The estimates in the 2010 Plan are systematically lower than those published in the 2007–2009 Plans. This difference reflects changes in the timing of projects that are now known with certainty. NRCan has tabulated their projection based on projects for which financing will amount to $1.4 billion, or 97% of the total budget for the program and which are expected to produce 13.8 GWh/yr once all plants are commissioned.[30]

Analysis

The key critique of the assessment of this program in the 2010 Plan remains the same as previous years. These estimates do not likely represent the incremental energy generation induced by the subsidy program — rather, these figures represent the total amount of generation occurring in projects financed by the subsidy program. These numbers represent a likely accurate representation of the effect of the program only if none of the financed projects would have been built absent the subsidy.[31] Evidence that this is not the case is provided below.

Examination of the financed projects provides evidence that many projects would have occurred without the ecoENERGY for Renewable Power Program. Some of the projects that receive financing through the ecoENERGY for Renewable Power program will also receive financing through provincial measures that predate the ecoENERGY for Renewable Power program such as the B.C. electricity purchase agreements offered under the two B.C. Calls for Power, or Quebec's 2007 Request for Proposals for Wind Power. The Quebec RFP was announced in October 2005 while the first 38 proposals under the initial B.C. Call for Power were awarded electricity purchase agreements in July of 2006, both before the announcement of the ecoENERGY for Renewable Power program. Consider, for example, the East Toba-Montrose Project proposed by Plutonic Power. East-Toba-Montrose was granted a power purchase agreement under the B.C. Call for Power on July 27, 2006, and will receive funding under the ecoENERGY for Renewable Power program despite being fully committed to supply power to B.C. before the ecoENERGY for Renewable Power program was announced. Similarly, Parc éolien de Baie-des-Sables Wind Farm in Quebec signed a contract to produce power in 2005, was commissioned in 2006, and began receiving support from the

[30] The estimates provided in the 2007–2009 Plans were based on estimated production of 4.7 TWh in 2008, 8.0 TWh in 2009, 11.7 TWh in 2010, and 14.3 TWh for 2011 and 2012 with an average capacity factor of 41% and an emissions reduction coefficient of 465.88 t/GWh. The figures in the 2010 Plan imply production of 2.9 TWh in 2008, 5.6 TWh in 2009, 10.1 TWh in 2010, and 12.9 TWh for 2011 and 2012 (assuming the same average capacity factor and emissions reduction coefficient).

[31] This amounts to what we have previously defined as the *free-rider* problem associated with subsidies.

ecoENERGY for Renewable Power Program in 2007.[32] The estimates provided by NRCan assume that none of these projects would have occurred absent a program that did not exist when they signed provincial contracts.

There is also concern that some projects financed through the Ontario *Green Energy and Green Economy Act, 2009*, and its ensuing standard offer program are viable only because of the provincial programs, and so they should not be considered an incremental impact of the ecoENERGY for Renewable Power program. At the very least, these projects should be counted in accordance with the contribution of the federal government. Consider, for example, the Sarnia Solar 5 project that is to be commissioned this year by Enbridge. The project will receive, under a 20-year power purchase agreement, a payment of 42¢/kWh for delivered power (a subsidy of 38.8¢/kWh over the average wholesale price for 2009 of 3.16¢/kWh)[33] from the Ontario Standard Offer Program, and an additional 1¢/kWh from the ecoENERGY for Renewable Power program. According to the Ontario Power Authority, similar projects cost between $10,000 and $14,000 per kW to install and are the most expensive of renewable power projects.[34] While it is not possible to say that the project would be built with a guarantee of 43¢ per kWh, but would not have been built at 42¢, it seems that the federal government program should consider itself a proportionate contributor to the induced emissions reductions and not, as they do for the purposes of this Plan, attribute 100% of the induced emissions reductions to the ecoENERGY for Renewable Power program.[35]

The Office of the Auditor General (OAG) of Canada published its *Framework for Identifying Risk in Grant and Contribution Programs*[36], in which the importance of judging the degree to which induced activities are incremental is emphasized. In the report, the OAG specifies that program managers should be able to provide justification for government involvement either through evidence that *"the project could not proceed, or not in the desired manner, without government funding,"* or that *"the funding is required to accelerate timing."* Each of these criterion suggests that, at both the design and evaluation phase, the question of whether any financed projects would have occurred absent the government financing is important. In assessing the impact of programs, only emissions reductions for projects for which the effect of the funding can clearly be shown to have moved the project forward or made it possible at all should be included.

As has been stated in previous NRTEE Responses, an important distinction must be made between policy design and policy evaluation. NRCan has made significant efforts to design the program to minimize *free-ridership*. Power projects for which rates of return exceed defined thresholds must return any subsidies paid to them, and the regulation does have a strict definition for incremental, renewable generation. However, design elements that minimize the potential for *free-ridership* do not necessarily eliminate the possibility of a subsidy being paid to a project that would have occurred without the program, as shown above. NRCan estimates rely on a best-case scenario estimate that none of the financed facilities would have been commissioned without the existence of the ecoENERGY for Renewable Power program.

Conclusions

The sources of overestimation cited in the 2007–2009 NRTEE Responses remain in the 2010 Plan for this program. Figures in the Plan do not represent incremental reductions in GHG emissions that will occur as a result of the policy. We have shown that some financed projects were producing energy before the ecoENERGY for Renewable Power program was announced while others receive a large majority of their funding from other sources. While some emission reductions will occur due to this initiative, the amount stated in the Plan is likely an overestimate.

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[32] In fact, 5 projects accounting for 370 MW or 8.5% of the financed capacity were commissioned before the program was announced.

[33] http://www.ieso.ca/imoweb/siteShared/monthly_prices.asp?sid=ic

[34] http://www.powerauthority.on.ca/sop/Page.asp?PageID=122&ContentID=4045

[35] Consultation with NRCan revealed that it considers the ecoENERGY for Renewable Power program to have been a "catalyst" for provincial programs such as Ontario's Standard Offer Program, and so considers it appropriate to claim all the induced emissions reductions from projects receiving financing from both programs.

[36] Canada, 2001, p. 10.

1.5 ECOENERGY FOR BUILDINGS AND HOUSES

Table 7: Summary of Analysis for ecoENERGY for Buildings and Houses

Program	Projected Emissions Reductions in Mt					Key Determinants of Results	Predictive Accuracy
	2008	2009	2010	2011	2012		
ecoENERGY for Buildings and Houses	0.58	0.98	1.26	1.49	1.81	-program offers information, while estimated reductions are based on significant regulatory changes	Likely overestimate
Change in Projected Emissions Reductions from 2009	0.26	0.42	0.13	-0.08	-0.21		

Summary of Initiative and Emissions Reductions

The ecoENERGY for Buildings and Houses program is an information-based initiative offering training, labelling, and rating of houses and buildings. The estimates for this program have changed slightly for 2010. According to the 2010 Plan, the new estimates account for earlier than anticipated energy building code adoption in Ontario and British Columbia (hence the greater reductions in 2008 and 2009) and some other provinces adopting new codes in September 2011 or later. This timing differs from the original targets, reflected in the 2009 KPIA report, which anticipated provinces adopting an updated code before March 2011.

Analysis

The bulk of forecast emissions reductions attributed to this program come through assumed changes in commercial building codes driven through the adoption of a non-binding Updated Model National Energy Code for Buildings (MNECB) and through the impacts of disseminating energy-efficient home building practices through labelling. According to methodology provided to the NRTEE by NRCan, "the overall savings estimate is contingent on adoption by all provincial/territorial jurisdictions by 2010/11." While the estimates have been scaled down for later years as compared to the 2009 Plan, the assumption of eventual adoption by a large number of provinces remains problematic.

National adoption of the MNECB has not occurred; however, evidence does exist that provinces may actually be ahead of the national code. B.C., Ontario, and Nova Scotia have announced changes to the building code to require energy efficiency equivalent to an EnerGuide rating of 80 — the EnerGuide labelling standard recommended in the Updated MNECB that will not be published until 2011. However, in the case of B.C., minimum code requirements will be updated to yield "energy performance equivalent to EnerGuide 80,"[37] while in Ontario, EnerGuide 80 will not be specifically required, but will be one of three options for compliance. In Nova Scotia, new homes have been required to display an EnerGuide rating since 2008, while minimum standards would require a rating of 72 by 2009, 77 by 2010, and 80 by 2011. Alberta will not adopt standards equivalent to the MNECB before at least 2014.[38]

The analysis underlying the estimate raises some concerns with respect to the attribution of emissions reductions. First, major changes to the building code requiring an immediate implementation of EnerGuide 80 ratings will not be in place in all jurisdictions by 2008–2012, and so the assumptions underlying the analysis are likely overly optimistic. Second, even if the regulatory changes were to be made, it would be difficult to directly attribute the emissions reductions resulting from these changes to a program that provides guidance, but does not enforce the regulation.

[37] http://www.housing.gov.bc.ca/building/green/faq.htm#03
[38] http://www.municipalaffairs.gov.ab.ca/documents/ss/GreenerHomesWrkbk.pdf

The analysis of the impacts of labelling of houses with respect to both the R-2000 Standard and EnerGuide Rating System under this program is also subject to concerns of *additionality*. Information provided to the NRTEE by NRCan states that in order to calculate energy savings from this aspect of the program, the expected energy savings per house are calculated by comparing the energy consumption of code-compliant average new construction with the energy consumption of rated houses under the two categories of labelling for energy-efficient new homes (i.e., R-2000 and EnerGuide Rating System). Total energy savings are obtained by multiplying the savings per house described above by the number of houses expected to be built.[39] This approach implicitly assumes that, absent the administration of the labelling program, no houses would be built and certified to these higher levels of energy efficiency. Attributing the effect of all new, energy-efficient construction to a program that provides a particular label and standard is likely to overestimate the induced emissions reductions. While there is value to demonstration projects, the R-2000 standard was created in 1981, and so is well known to the building community.

Conclusions

As stated in previous evaluations, the assumptions made by NRCan for evaluation of this program are likely to lead to an overestimate of the program's impact. While the program provides information and labelling, the estimated emissions reductions are based in part on significant changes to building codes being implemented at the provincial level. Some provinces have changed or will change current building codes to include more stringent requirements based on the EnerGuide labelling system; however, the existence of the labels and associated information has not necessarily led to all of these changes. Further, the program attributes energy savings from all new homes built and certified to R-2000 standards or labelled through the EnerGuide Initiative to the program, which does not account for the possibility that some houses are built to higher standards of energy efficiency due to other factors such as high energy prices. The estimated impacts thus likely overestimate the impact of this labelling, training, and information program.

[39] Canada, 2009b.

1.6 ecoENERGY RETROFIT INITIATIVE

Table 8: Summary of Analysis for ecoENERGY Retrofit Initiative

Program	Projected Emissions Reductions in Mt					Key Determinants of Results	Predictive Accuracy
	2008	2009	2010	2011	2012		
ecoENERGY Retrofit	0.39	0.67	1.72	1.94	1.94	-treatment of *free-ridership* -conversion of predicted energy savings to realized emissions reductions -*rebound effect*	Likely overestimate
Change in Projected Emissions Reductions from 2009	-0.07	0	0.52	0.28	0.28		

Summary of Initiative and Emissions Reductions

The ecoENERGY Retrofit Initiative offers subsidies to owners of homes and small- to medium-sized businesses upon completion of retrofits that verifiably improve the energy-efficiency rating of the building. The Plan projects reductions resulting from this program of 0.39 Mt in 2008 up to 1.94 Mt in 2012, or roughly 0.25 Mt per cumulative-program-year of emissions savings. These estimates have increased from those published in the 2007, 2008, and 2009 Plans. The program ceased accepting bookings for new retrofit evaluations on March 31, 2010, and so there is now greater certainty with respect to the number of potential retrofits that may be completed.

Analysis

The ecoENERGY Retrofit Initiative's effects on actual emissions will occur in two ways. First, the program may lead homeowners to complete more extensive renovations than they otherwise would have, or it may lead to renovations being more energy focused then would otherwise have been the case. Second, the program may lead to homeowners undertaking renovations earlier than they otherwise would, or may incent homeowners who would not otherwise have undertaken a renovation or retrofit to do so.

The reductions published as a result of this initiative in the Plan do not identify which renovations were induced by the initiative. Rather, all energy saved through all renovations for which any financing was received is attributed to the program. The KPIA obligates the government to assess the degree to which programs lead to emissions reductions, and the government has chosen to define reductions as actual GHG emissions reductions relative to *business-as-usual* (what would have otherwise occurred) achieved over the Kyoto period. The numbers provided for the ecoENERGY for Retrofits Initiative answer a different question — they reflect the total GHG emissions reductions that will occur during the Kyoto period as a result of emissions-reducing activities financed by the program, whether or not these would have occurred without the program in place.

Consider the following examples, which look at the same renovations undertaken on identical houses:

1. Suppose the homeowners undertake a renovation entirely as a result of the program. Their initial audit estimates that by undertaking all of the suggested renovations, they will improve their home's energy efficiency by 30%, thus potentially saving 33 GJ/year based on their previous year's energy use of 100 GJ. They complete all the renovations, and so the program will have reduced their potential energy consumption by 33 GJ relative to *business-as-usual. The methodology used in the Plan correctly evaluates the energy efficiency impact of all financed retrofits of this type.*

2. Suppose the homeowners plan to undertake a renovation because they are concerned about the size of their energy bills. The household hires a contractor who suggests they apply for the

ecoENERGY Retrofit Initiative, and they do so. As a result of the program, they decide to increase the scope of their renovation and are better educated as to the best areas to target to increase energy efficiency. Their original plans would have increased their energy efficiency by 20%, potentially saving them 20 GJ of energy per year, but as a result of participating in the ecoENERGY Retrofit Initiative, they actually undertake all the recommended renovations and see a further improvement of 10% GJ for a total efficiency improvement of 30% with potential energy savings of 33 GJ. The potential impact of the ecoENERGY Retrofit Initiative in this case would be 13 GJ relative to the *business-as-usual*. However, the methodology used by NRCan would evaluate the impact of the ecoENERGY Retrofit Initiative in this renovation at the same 33 GJ. *As such, the methodology overestimates the impact of the ecoENERGY Retrofit Initiative in this case.*

3. Suppose the household plans to undertake renovations that qualify for funding under the ecoENERGY Retrofit Initiative, but would have undertaken the same renovations irrespective of the program. With or without the program in place, the renovations increase the energy efficiency in the house by 30% or 33 GJ/year. The ecoENERGY Retrofit Initiative has not altered the energy consumption of this household relative to what it would otherwise have been, and so the program has no impact on emissions reductions. *However, the methodology used by NRCan would evaluate the impact of the program at the full 33GJ in this case as well.*

4. Suppose the homeowners plan to undertake a renovation after 2012; however, they decide to have an initial audit completed under the ecoENERGY Retrofit Initiative to validate their plans and to see how much they might save through the grant. As a result of the program, they decide to perform the renovation before 2012, but not to change the scope of their planned renovation. The renovations lead to an efficiency improvement of 30% with potential energy savings of 33 GJ. *The evaluation measures used by NRCan would correctly evaluate the impact of the ecoENERGY Retrofit Initiative in this case since the emissions reductions occurring during the KPIA period would, in fact, have been entirely induced by the program.*

In other words, the program evaluation is most accurate if all the financed renovations were unplanned and would not have otherwise taken place at any time during the KPIA period (#1 or #4 above). Otherwise, the program evaluation methodology employed by NRCan likely overestimates the impact of the program on energy efficiency. In effect, the methodology claims a role in renovations that would have occurred absent the policy, and so overstates its impact.

An issue that was also raised in the 2007–2009 NRTEE Responses is the fact that retrofit subsidies reward energy efficiency, not diminished total energy consumption. Literature provides extensive evidence that increases in energy efficiency provide an incentive to increase the intensity of use or the total number of certain energy-using technologies (through the *rebound effect*). In fact, NRCan's own program evaluations suggest that its assumptions may be less accurate than assumed. In an evaluation of the similar EnerGuide for Houses program, it was found that predicted emissions savings resulting from renovations was 4 tonnes, while the average realized emissions savings was found to be 1.4 tonnes per household, or less than half the predicted savings at the time.[40]

An issue not addressed in the 2009 or 2010 Plans is the role of the Home Renovation Tax Credit. This program provided an incentive for homeowners to undertake renovations (some of which were likely incremental to *business-as-usual*), and some of these renovations will likely include energy efficiency improvements that would not have occurred otherwise. The Tax Credit combined with the ecoENERGY for Retrofits and some matching provincial and municipal programs may have added a compelling incentive for families to improve the energy efficiency and reduce the energy consumption of their dwellings.[41]

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[40] Canada, 2006b.

[41] In fact, Finance Canada was co-promoting the two programs on its website, stating that "federal grants paid through the ecoENERGY Retrofit – Homes program will not reduce the value of claims made for the expenditures under the HRTC." Both the Tax Credit and any interactions with the ecoENERGY for Retrofits and other programs would likely affect the resulting emissions reductions.

Conclusions

The estimates in the 2010 Plan, like those in 2007–2009, claim all the energy savings from all retrofits receiving financing. The implicit assumption is that none of these retrofits would have occurred without the grant — that there are no *free riders*. Further, the estimates in the Plan directly translate forecasted energy-efficiency gains into emissions reductions, without explicitly accounting for *rebound effects* that previous NRCan studies have shown to be potentially important. The resulting emissions reductions will therefore likely be overestimated.

1.7 ECOENERGY FOR INDUSTRY

Table 9: Summary of Analysis for ecoENERGY for Industry

Program	Projected Emissions Reductions in Mt					Key Determinants of Results	Predictive Accuracy
	2008	2009	2010	2011	2012		
ecoENERGY for Industry	0.64	1.03	1.44	1.54	1.54	-definition of a program participant	Likely overestimate
Change in Projected Emissions Reductions from 2009	0.47	0.76	1.07	1.14	1.14		

Summary of Initiative and Emissions Reductions

The ecoENERGY for Industry program is an information-sharing program intended to speed the progress to new technologies and adoption of best practices in energy use. The program also provides training and assessments to help energy managers identify and implement energy-saving projects. The 2010 Plan states that the emissions savings estimates for ecoENERGY for Industry were calculated as the sum of two components:

1. Energy Savings from the Canadian Industry Program for Energy Conservation (CIPEC)

2. Energy Savings from site-specific energy assessments

In previous KPIA Plans, figures for the CIPEC had only reflected participants from smaller facilities that were not expected to be covered by the Regulatory Framework for Air Emissions. This year, expected emissions reductions have been increased as a result of the elimination of the large final emitters regulations, under the assumption that these facilities will now be able to benefit from the information provided.

Analysis

Information programs are difficult to assess because one cannot easily rely on empirical evidence. Identifying differences in behaviour between those receiving information and those who do not is a challenge.[42] Further, self-selection also adds to uncertainty in that individuals already looking to reduce energy consumption are more likely to seek out information on how to do so. Some research has, however, suggested that historical information programs have had only limited impacts on emissions reductions given *free-ridership* issues and the extent to which energy efficiency improvements would occur in the absence of the program.[43]

In order to assess the impact of this program, NRCan assumes that individuals informed through seminars, newsletters, etc. can achieve significant reductions in energy consumption within their facilities.[44] The key assumptions made in order to assess the impact of the program are the future numbers of participants and most importantly, the achieved energy savings from seminar participation. According to NRCan, the impacts were assumed to be equivalent to a 3% reduction in an average facility's emissions for each participant.

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[42] Gillingham, Newell, and Palmer, 2006.

[43] See Loughran and Kulick, 2004; Jaccard *et. al*, 2006.

[44] For calculating emissions reductions, NRCan reports that they assume a reduction of 0.000073469 Mt per facility (takes into account the emissions factor and PJ of energy saved per facility). Emissions reductions are therefore based on 2007/08 – 4373 facilities = 0.32 Mt, 2008/09 – 4558 facilities = 0.66 Mt, 2009/10 – 4709 facilities = 1.00 Mt, 2010/11 – 4985 facilities = 1.37 Mt (expected for 2010/11).

The definition of "participant" raises important questions. A participant was defined as follows:

> *CIPEC participants are defined as all industrial facilities represented in the program client database. This includes over 4000 workshop participants as well as recipients of newsletters and publications. CIPEC participation is expected to grow by 14 percent per year starting with a baseline of 5365 participants in the 2006–2007 fiscal year. The growth in participation is based on the continuation of historical growth (years 2001–2002 to 2006–2007) adjusted for changes in funding.*[45]

This definition groups both active and passive participants into the same category, and attributes identical emissions reductions to all facilities defined as participants. The impact of active participation will likely be much greater than that of passive participation (i.e. receiving publications), and the fact that this is not directly reflected in the estimates likely leads to an overestimate.

When firms send representatives to such workshops, it is likely because they have an interest in improving their performance, and so it may be possible for self-selected seminar participants who are obviously interested in improving their facilities' energy efficiency to report significant (i.e., 3%) reductions in energy use in the periods after participating. Documentation provided to the NRTEE by NRCan states that, "it was estimated that CIPEC participants will save 0.69 TJ each per year through the program. This was determined by using data from a 2003 ...study of over 1000 facilities (both program participants and non-participants)...(that)...concluded that the percent change in energy use for CIPEC participants was 3 percent less than for non-participants. The 0.69 TJ savings is calculated by taking 3 percent of the average energy use per facility (23 TJ) as provided by the impact study."[46] What is not clear from the information is whether the CIPEC was entirely responsible for decisions to reduce energy use, or whether CIPEC participation was part of an overall energy-reduction strategy. Facilities seeking to reduce energy consumption are likely to seek out information on how best to do so. In such a case, the information provided by CIPEC would likely play a role in reducing energy use, but would likely not be the sole driver of energy and emissions reductions. However, the impact study would attribute all of the gains realized to the CIPEC program. As a result, we conclude that this assumption likely leads to an overestimate.

The inclusion of larger facilities may also be problematic. In smaller facilities, it may be possible for a single individual to implement broad energy-saving measures that affect the entire operation, but this seems less likely for a large facility. It is more likely that the individuals attending the seminar from larger facilities are responsible for a small part of that facility, and so any implemented improvements would likely have smaller reach.

A second set of emissions reductions are attributed to site-specific assessments.[47] To obtain the total energy savings, the program multiplied the average savings per assessment (.005 Mt/study) above by an expected 30 assessments over four years. Given the small number of assessments performed, it is not possible to assess these numbers without specific information on the sites visited and the follow-up information collected.

Conclusions

The estimates for this program rely on an assumption that significant energy savings can be achieved through the provision of information. While it is inherently difficult to assess the impact of information, it seems implausible that a facility receiving a newsletter would have the same induced emissions reductions as a facility that has sent representatives to attend seminars on energy conservation. Further, it seems likely that active participants who have chosen to send representatives to seminars are doing so as part of an overall effort to reduce energy consumption, and, if so, *all* future reductions in energy use

[45] Canada, 2009b, p. 12.
[46] Canada, 2009b, p. 12.
[47] Site specific assessments (each site assessment results in an expected 0.005 Mt reduction) were multiplied by the expected numbers of annual assessments as follows: 2007/08 – 6 assessments = 0.03 Mt; 2008/09 – 10 assessments = 0.08 Mt; 2009/10 – 10 assessments = 0.13 Mt; 2010/11 – 10 assessments = 0.18 Mt (expected for 2010/11).

in these facilities should not be attributed to the program, although there may be some. Given that this assumption adds a significant number of participants to the assessment, it likely leads to an overestimate of the program's impact on emissions.

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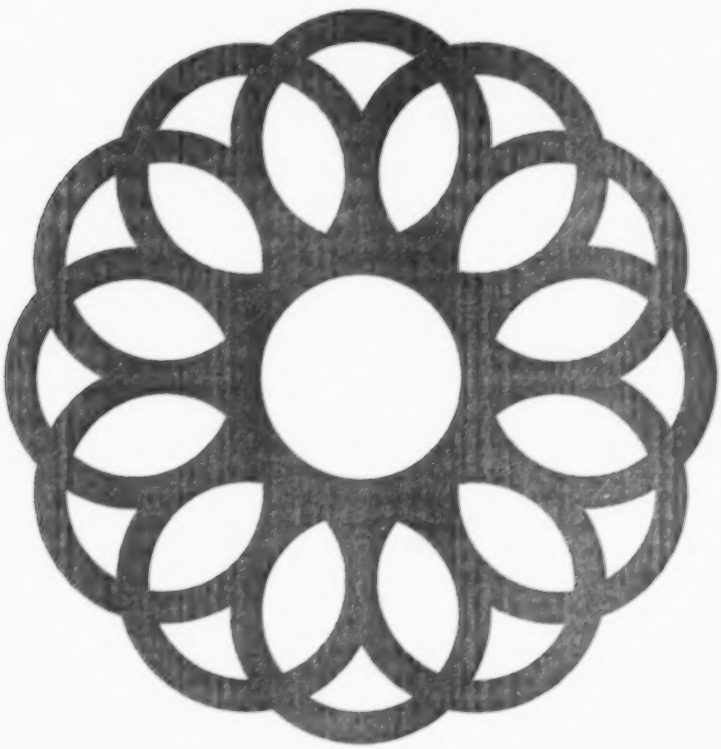
/ APPENDIX B: KYOTO PROTOCOL IMPLEMENTATION ACT



APPENDIX B: KYOTO PROTOCOL IMPLEMENTATION ACT

Department of Justice Canada | Ministère de la Justice Canada | Canada

Kyoto Protocol Implementation Act (2007, c. 30)
Disclaimer: This document is not the official version.
Act current to September 21st, 2007
Attention: See coming into force provision and notes, where applicable.

Kyoto Protocol Implementation Act

2007, c. 30

K-9.5

[Assented to June 22nd, 2007]

An Act to ensure Canada meets its global climate change obligations under the Kyoto Protocol

Preamble

Recognizing that

Canadians have a deep pride in their natural environment, and in being responsible stewards of their land,

Canada is committed to the principle of environmentally sustainable development, a healthy economy and a healthy society depend on a healthy environment,

Canadians want to take responsibility for their environmental problems, and not pass those problems on to future generations,

global climate change is one of the most serious threats facing humanity and Canada, and poses significant risks to our environment, economy, society and human health,

the national science academies of Canada, Brazil, China, France, Germany, India, Italy, Japan, Russia, the United Kingdom and the United States declared the following in June 2005: "The scientific understanding of climate change is now sufficiently clear to justify nations taking prompt action. It is vital that all nations identify cost-effective steps that they can take now, to contribute to substantial and long-term reduction in net global greenhouse gas emissions.",

climate change is a global problem that crosses national borders,

Canada has a clear responsibility to take action on climate change, given that our per capita greenhouse gas emissions and wealth are among the highest in the world, and that some of the most severe impacts of climate change are already unfolding in Canada, particularly in the Arctic,

the objective of the United Nations Framework Convention on Climate Change (UNFCCC) is "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system",

Canada has ratified the UNFCCC, which entered into force in 1994,

the Kyoto Protocol requires that Canada reduce its average annual greenhouse gas emissions during the period 2008-2012 to six per cent below their level in 1990,

Canada ratified the Kyoto Protocol in 2002 following a majority vote in Parliament, and the Protocol entered into force in 2005,

this legislation is intended to meet, in part, Canada's obligations under the UNFCCC and the Kyoto Protocol, and

the problem of climate change requires immediate action by all governments in Canada as well as by corporations and individual Canadians,

NOW, THEREFORE, Her Majesty, by and with the advice and consent of the Senate and House of Commons of Canada enacts as follows:

SHORT TITLE

Short title

1) This Act may be cited as the Kyoto Protocol Implementation Act.

INTERPRETATION

Definitions

2) The definitions in this section apply in this Act.

"Climate Change Plan"
«Plan sur les changements climatiques »

"Climate Change Plan" means a plan that meets the conditions set out in section 5.

"greenhouse gas"
«gaz à effet de serre »

"greenhouse gas" means one of the greenhouse gases listed in Annex A to the Kyoto Protocol.

"Kyoto Protocol"
«Protocole de Kyoto »

"Kyoto Protocol" means the Kyoto Protocol to the United Nations Framework Convention on Climate Change, agreed to on December 11, 1997 at Kyoto, Japan, and ratified by Canada on December 17, 2002, as amended from time to time, to the extent that the amendment is binding on Canada.

"Minister"
«ministre »

"Minister" means the Minister of the Environment.

PURPOSE

Purpose

3) The purpose of this Act is to ensure that Canada takes effective and timely action to meet its obligations under the Kyoto Protocol and help address the problem of global climate change.

HER MAJESTY

Binding on Her Majesty

4) This Act is binding on Her Majesty in Right of Canada.

CLIMATE CHANGE PLAN

Climate Change Plan

5) (1) Within 60 days after this Act comes into force and not later than May 31 of every year thereafter until 2013, the Minister shall prepare a Climate Change Plan that includes

a) a description of the measures to be taken to ensure that Canada meets its obligations under Article 3, paragraph 1, of the Kyoto Protocol, including measures respecting

i) regulated emission limits and perform¬ance standards,
ii) market-based mechanisms such as emissions trading or offsets,
iii) spending or fiscal measures or incentives,
(1) a just transition for workers affected by greenhouse gas emission reductions, and
iv) cooperative measures or agreements with provinces, territories or other governments;

b) each measure referred to in paragraph (a),
i) the date on which it will come into effect, and
ii) the amount of greenhouse gas emission reductions that have resulted or are expected to result for each year up to and including 2012, compared to the levels in the most recently available emission inventory for Canada;

c) the projected greenhouse gas emission level in Canada for each year from 2008 to 2012, taking into account the measures referred to in paragraph (a), and a comparison of those levels with Canada's obligations under Article 3, paragraph 1, of the Kyoto Protocol;

d) an equitable distribution of greenhouse gas emission reduction levels among the sectors of the economy that contribute to greenhouse gas emissions;

e) a report describing the implementation of the Climate Change Plan for the previous calendar year; and

f) a statement indicating whether each measure proposed in the Climate Change Plan for the previous calendar year has been implemented by the date projected in the Plan and, if not, an explanation of the reason why the measure was not implemented and how that failure has been or will be redressed.

Provinces

(2) A Climate Change Plan shall respect provincial jurisdiction and take into account the relative greenhouse gas emission levels of provinces.

Publication

(3) The Minister shall publish

a) within 2 days after the expiry of each period referred to in subsection (1), a Climate Change Plan in any manner the Minister considers appropriate, with an indication that persons may submit comments about the Plan to the Minister within 30 days of the Plan's publication; and

b) within 10 days after the expiry of each period referred to in subsection (1), a notice of the publication of the Plan in the *Canada Gazette*.

Tabling

(4) The Minister shall table each Climate Change Plan in each House of Parliament by the day set out in subsection (1) or on any of the first three days on which that House is sitting after that day.

Committee

(5) A Climate Change Plan that is laid before the House of Commons is deemed to be referred to the standing committee of the House that normally considers matters relating to the environment or to any other committee that that House may designate for the purposes of this section.

REGULATIONS

Regulations

6) (1) The Governor in Council may make regulations

a) limiting the amount of greenhouse gases that may be released into the environment;
   (1) within the limits of federal constitutional authority, limiting the amount of greenhouse gases that may be released in each province by applying to each province Article 3, paragraphs 1, 3, 4, 7, 8, and 10 to 12, of the Kyoto Protocol, with any modifications that the circumstances require;

b) establishing performance standards designed to limit greenhouse gas emissions;

c) respecting the use or production of any equipment, technology, fuel, vehicle or process in order to limit greenhouse gas emissions;

d) respecting permits or approvals for the release of any greenhouse gas;

e) respecting trading in greenhouse gas emission reductions, removals, permits, credits, or other units;

f) respecting monitoring, inspections, investigations, reporting, enforcement, penalties or other matters to promote compliance with regulations made under this Act;

g) designating the contravention of a provision or class of provisions of the regulations by a person or class of persons as an offence punishable by indictment or on summary conviction and prescribing, for a person or class of persons, the amount of the fine and imprisonment for the offence; and

h) respecting any other matter that is necessary to carry out the purposes of this Act.

Measures province considers appropriate

(2) Despite paragraph (1)(a.1), and for greater certainty, each province may take any measure that it considers appropriate to limit greenhouse gas emissions.

Obligation to implement Kyoto Protocol

7) (1) Within 180 days after this Act comes into force, the Governor in Council shall ensure that Canada fully meets its obligations under Article 3, paragraph 1, of the Kyoto Protocol by making, amending or repealing the necessary regulations under this or any other Act.

Obligation to maintain implementation of Kyoto Protocol

(2) At all times after the period referred to in subsection (1), the Governor in Council shall ensure that Canada fully meets its obligations under Article 3, paragraph 1, of the Kyoto Protocol by making, amending or repealing the necessary regulations under this or any other Act.

Other governmental measures

(3) In ensuring that Canada fully meets its obligations under Article 3, paragraph 1, of the Kyoto Protocol, pursuant to subsections (1) and (2), the Governor in Council may take into account any reductions in greenhouse gas emissions that are reasonably expected to result from the implementation of other governmental measures, including spending and federal-provincial agreements.

Consultation for proposed regulations

8) At least 60 days before making a regulation under this Act or, with respect to subsections 7(1) and (2), any other Act, the Governor in Council shall publish the proposed regulation in the Canada Gazette for consultation purposes with statements:

a) setting out the greenhouse gas emission reductions that are reasonably expected to result from the regulation for every year it will be in force, up to and including 2012; and
b) indicating that persons may submit comments to the Minister within 30 days after the publication of the regulation.

EXPECTED REDUCTIONS

Minister's statement

9) (1) Within 120 days after this Act comes into force, the Minister shall prepare a statement setting out the greenhouse gas emission reductions that are reasonably expected to result for each year up to and including 2012 from

a) each regulation made or to be made to ensure that Canada fully meets its obligations under Article 3, paragraph 1, of the Kyoto Protocol, pursuant to subsections 7(1) and (2); and

b) each measure referred to in subsection 7(3).

Minister

(2) The Minister shall

a) publish the statement in the Canada Gazette and in any other manner that the Minister considers appropriate within 10 days of the period set out in subsection (1); and
b) table the statement in each House of Parliament by the day set out in subsection (1) or on any of the first three days on which that House is sitting after that day.

REPORT

National Round Table on the Environment and the Economy

10) (1) Within 60 days after the Minister publishes a Climate Change Plan under subsection 5(3), or within 30 days after the Minister publishes a statement under subsection 9(2), the National Round Table on the Environment and the Economy established by section 3 of the National Round Table on the Environment and the Economy Act shall perform the following with respect to the Plan or statement:

a) undertake research and gather information and analyses on the Plan or statement in the context of sustainable development; and

b) advise the Minister on issues that are within its purpose, as set out in section 4 of the National Round Table on the Environment and the Economy Act, including the following, to the extent that they are within that purpose:
   i) the likelihood that each of the proposed measures or regulations will achieve the emission reductions projected in the Plan or statement,
   ii) the likelihood that the proposed measures or regulations will enable Canada to meet its obligations under Article 3, paragraph 1, of the Kyoto Protocol, and
   iii) any other matters that the Round Table considers relevant.

Minister

(2) The Minister shall

a) within three days after receiving the advice referred to in paragraph (1)(b):
   i) publish it in any manner that the Minister considers appropriate, and
   ii) submit it to the Speakers of the Senate and the House of Commons and the Speakers shall table it in their respective Houses on any of the first three days on which that House is sitting after the day on which the Speaker receives the advice; and

b) within 10 days after receiving the advice, publish a notice in the Canada Gazette setting out how the advice was published and how a copy of the publication may be obtained.

Commissioner of the Environment and Sustainable Development

10.1 (1) At least once every two years after this Act comes into force, up to and including 2012, the Commissioner of the Environment and Sustainable Development shall prepare a report that includes
a) an analysis of Canada's progress in implementing the Climate Change Plans;

b) an analysis of Canada's progress in meeting its obligations under Article 3, paragraph 1, of the Kyoto Protocol; and

c) any observations and recommendations on any matter that the Commissioner considers relevant.

Publication of report

(2) The Commissioner shall publish the report in any manner the Commissioner considers appropriate within the period referred to in subsection (1).

Report to the House of Commons

(3) The Commissioner shall submit the report to the Speaker of the House of Commons on or before the day it is published, and the Speaker shall table the report in the House on any of the first three days on which that House is sitting after the Speaker receives it.

OFFENCES AND PENALTIES

Offences

11) (1) Every person who contravenes a regulation made under this Act is guilty of an offence punishable by indictment or on summary conviction, as prescribed by the regulations, and liable to a fine or to imprisonment as prescribed by the regulations.

Subsequent offence

(2) If a person is convicted of an offence a subsequent time, the amount of the fine for the subsequent offence may, despite the regulations, be double the amount set out in the regulations.

Continuing offence

(3) A person who commits or continues an offence on more than one day is liable to be convicted for a separate offence for each day on which the offence is committed or continued.

Additional fine

(4) If a person is convicted of an offence and the court is satisfied that monetary benefits accrued to the person as a result of the commission of the offence, the court may order the person to pay an additional fine in an amount equal to the court's estimation of the amount of the monetary benefits, which additional fine may exceed the maximum amount of any fine that may otherwise be imposed under the regulations.

Officers, etc., of corporations

(5) If a corporation commits an offence, any officer, director, agent or mandatory of the corporation who directed, authorized, assented to, or acquiesced or participated in, the commission of the offence is a party to and guilty of the offence and is liable on conviction to the punishment provided for the offence, whether or not the corporation has been prosecuted or convicted.

Offences by employees or agents

(6) In any prosecution for an offence, the accused may be convicted of the offence if it is established that it was committed by an employee, agent or mandatory of the accused, whether or not the employee, agent or mandatory has been prosecuted for the offence.

9.0

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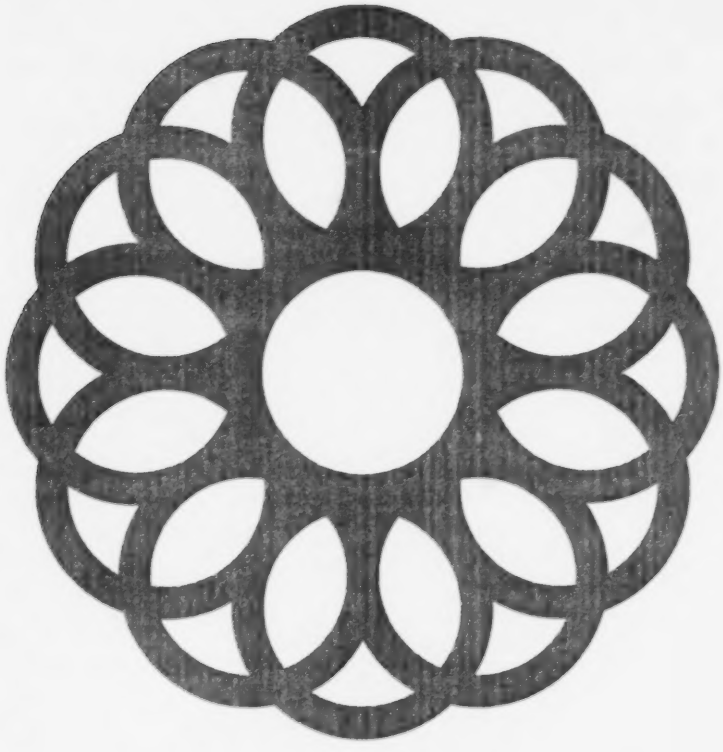

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